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TRAUMA AND THE NERVOUS SYSTEM

WITH SPECIAL REFERENCE TO HEAD INJURIES AND A CLASSIFICATION OF POST-TRAUMATIC SYNDROMES (ANALYSIS OF ONE HUNDRED CASES)

I. S. WECHSLER, M.D.

NEW YORK

The subject of trauma and the nervous system, more particularly trauma to the head, has undergone considerable revision in recent years. More accurate investigation of the pathologic changes of concussion of the brain, increasingly objective clinical studies and the introduction of encephalography have enriched with facts a subject which hitherto was to a large extent in the realm of opinion. None the less there is still considerable dispute among competent neurologists as to what is and what is not objective evidence, and opinion, if not bias, still bridges gaps which should be filled in with facts.

The relation of trauma to the nervous system and its sequels is complicated not alone by difficulties of diagnosis but by medicolegal problems and by difficulties in medical and social management. The problem is further complicated by the fact that most human beings are easily suggestible and that trauma occasionally offers an escape from difficulties in life which are not always easy to face. Added to these are the modern industrial compensation provisions, the occasional bad management on the part of lawyers and physicians, and the general encouragement to litigation on the part of almost everybody. Finally, the frequent insistence on positive statements, which the neurologist cannot always make, and the conflicting opinion of experts taking sides in doubtful cases add extraneous difficulties to a question which is sufficiently complex in itself and which the neurologist can hope to solve only on its neurologic and psychiatric merits.

It is extremely difficult to dislodge erroneous views and old concepts made respectable by medical and lay tradition; thus, for example, the question of fracture of the skull. It is well known that a person may receive a severe blow to the skull and sustain no fracture and no injury to the brain; he may receive a comparatively light blow and sustain both fracture of the skull and injury to the brain; he may sustain a fracture and no brain damage; he may have no fracture and yet have severe injury of the brain. A person may even receive no direct blow and still suffer grave cerebral injury. All these facts are well known to neurologists. They have insisted on the importance of injury to the brain, the meninges, the cerebral and meningeal vessels or the cerebral nerves, and on the significance of prolonged unconsciousness and not on whether there was or was not a fracture; yet most people still continue to stress and to attach undue significance and importance to the fracture itself.

As the subject of trauma and the nervous system is far too big for a brief paper, I shall devote the major part of this paper to a discussion of trauma to the head and to a classification of the syndromes which may subsequently develop. The discussion is based on the study of 100 consecutive, unselected cases of head injury culled from a general neurologic office practice. I believe that the importance of this series, even though the number is admittedly small, derives from the fact that it represents a cross-section of all types of cases seen after the acute stage was over and therefore permits some general conclusions. Before I proceed with the analysis of the cases and the classification of syndromes, however, it may be well to lay down a few general principles.

GENERAL CONSIDERATIONS [1]

Traumatic cases may be divided into the following classes:

1. Cases in which injury to the nervous system is the direct and immediate result of an accident. Following a fall or direct or indirect blow to the head there may be unconsciousness, fracture of the skull, intracranial bleeding, severe injury to the brain and cerebral nerves, paralyses and other sequels. A similar accident may result in such conditions as a dislocation or fracture of the spine, crushing of the spinal cord, hemorrhage into the meninges or hematomyelia. Various forms of trauma, such as stab wounds and fracture of bones, may cause peripheral nerve injuries. Emergence from chambers filled with compressed air may give rise to the myelopathy known as caisson disease. Contact with high voltage current, if not immediately fatal, may lead to prolonged unconsciousness, convulsions, transient or permanent paralysis, and a host of mental and psychic sequelae. Cases falling into this group present no debatable points, certainly no doubt as to the causal relationship of the trauma to the clinical syndrome. There may arise the questions of responsibility and contributory negligence, both of which are obviously dependent on the veracity and competence of witnesses, but neither has anything to do with the purely medical aspects of the case.

Read before the Section on Nervous and Mental Diseases at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Some of these have been published previously in the author's Textbook of Clinical Neurology, Philadelphia, W. B. Saunders Company, 1931.

2. Cases in which the nervous system shows the effects of trauma several hours or a few days, sometimes a number of weeks, after the receipt of the injury. Meningeal hemorrhage may occur a day or two after a blow to the skull; apoplexy may follow several days after injury to the head; meningitis may set in days or weeks after fracture of the skull; abscess of the brain may manifest itself days, weeks or even months after a brain injury; a subdural hematoma may be diagnosed months after the receipt of a blow to the head. This group of cases presents no debatable points, though there is no unanimity of opinion on the question of apoplexy, particularly regarding the condition known as late apoplexy.

TABLE 1.—*Duration of Symptoms*

Duration	Number of Cases
1 to 6 months	29
7 to 12 months	24
1 to 2 years	21
2 to 3 years	11
3 to 6 years	15

3. Cases showing no immediate effects of injury to the brain, but only well attested sequels. Convulsions, particularly focal epilepsy, may set in months or years after injury to the head and brain; optic atrophy or spinal cord degeneration may appear months after contact with electric currents; ulnar paralysis may result from late callus in fracture of the internal condyle months or years after the injury. An arteriovenous aneurysm may develop a very long time after fracture of the skull, while mental deterioration is known to occur in children who had brain injuries. There is no disagreement as to facts, but there may be some difference of opinion as to interpretation.

4. Cases in which disturbance of the brain follows immediately or within a reasonable period after an injury to the head, but the trauma alone is not responsible. Thus, a man with undetected incipient dementia paralytica may receive a blow to the head and the fulminating disease may rapidly develop, then gallop on to a fatal termination. An alcoholic person or one with cerebral arteriosclerosis may rapidly deteriorate after a blow to the head. A person may fall during a convulsion and receive a brain injury which aggravates the convulsive state and leads to deterioration. Such traumas may be said to aggravate or possibly precipitate but not to cause disease of the nervous system, and differences of opinion are justified regarding the group.

TABLE 2.—*Duration of Unconsciousness*

State	Number of Cases
No unconsciousness	28
Momentary unconsciousness	12
Unconscious for from 5 to 15 minutes	16
Unconscious for from half an hour to several hours	32
Unconscious one day or longer	12

5. Cases in which there is the question of the relation of head trauma to infectious and other diseases of the nervous system. The relation of head trauma to such infections and diseases of the nervous system as encephalitis, meningococcic meningitis, brain tumor and paralysis agitans is highly debatable. Parker and Kernohan [2] have thoroughly disposed of the question of gliomas and head injury.

6. Cases with no early or late evidence of brain injury subsequently presenting subjective complaints. This most important group consists of patients who, following the receipt of an injury to the head, with or without unconsciousness, show few or no organic signs at the time of the accident and no evidence of brain injury subsequently yet present a host of subjective complaints, a number of essentially mental signs and symptoms which incapacitate the individuals. This is the most debated group of all, and it is the one that I would discuss at greater length.

ANALYSIS OF ONE HUNDRED CASES

The records under analysis are of those of patients referred to me by physicians and lawyers. Sixty-two [3] were litigation cases, wherein a medicolegal opinion alone was requested; thirty-eight patients came for diagnosis and treatment. Thirty-one patients were females and sixty-nine were males. Practically every occupation and every walk of life was represented, the majority being employees. The youngest patient was 3 years old, the oldest was 69; the average age was 37; only four were below 10; seven were between 10 and 20, and eighty-nine were over 20. The duration of the symptoms from the date of the injury to the time the patients came under observation (table 1) ranged from one month to six years. In eighty-nine instances the symptoms dated back to the time of the injury; in only eleven cases was there a so-called incubation period ranging from one month to several months. That is, there was a period of well being after the accident; the patient returned to work and only after a period of time did incapacitating symptoms appear. All these patients had subjective complaints, all were litigation cases, and in all but two there was no history of unconsciousness. Table 2 shows the number of cases with and without unconsciousness and the duration when it was possible to determine it. This was not always easy in cases in which it was said to be momentary or to have lasted several minutes, but it probably is accurate. As will be seen, and this merely confirms the general experience, the number of patients who had prolonged unconsciousness, from one-half hour and longer, correlates very well with the number of cases of fracture of the skull, brain injury and concussion with encephalopathy. Also the number of cases with brief or no unconsciousness tallies with the number of those in which the diagnosis of hysteria or malingering was made. All patients with convulsions gave a history of prolonged unconsciousness after the accident.

TABLE 3.—*Types of Organic Signs*

Organic Signs	Number of Cases
Hemiparesis or hemiplegia	7
Inequality of reflexes	8
Inequality of pupils	5
Ocular palsies	2
Sensory disturbances	3
Parkinson syndrome	1

Twenty-six patients showed major or minor evidence of organic involvement of the nervous system; in seventy-four the sequels were limited to mental symptoms. Tables 3 and 4 show the types of organic signs and sequels. In the one case in which a parkinsonian syndrome was found, the patient was overcome by smoke in addition to sustaining a fall and blow to the head which rendered him unconscious. An explanation

2. Parker, H. L., and Kernohan, J. W.: The Relation of Injury and Glioma of the Brain, J. A. M. A. **97**: 535-540 (Aug. 22) 1931.

3. As I am dealing with a group of 100 cases, all figures refer both to the numbers and to the percentages.

for the apparent lack of correlation between the sequels and the organic signs may be found in the fact that some patients with no objective organic signs had such sequels as convulsions, conduct disorders or mental defects, while others with merely a few minor signs complained essentially of subjective disturbances. The latter, which will be discussed presently, refer to the symptoms which are generally classified as psychoneurotic; although in many instances they are based on definite pathologic changes of the brain.

The diagnoses (table 5) were based on a complete neurologic examination of every patient and on as thorough a psychiatric investigation as can be made in one or two hours. All patients had records of roentgen examination of the skull, a great many had records of lumbar punctures, a number had records of psychometric tests, and a few had reports of encephalographic studies. The one patient with traumatic psychosis was a man of 60; another patient who had a psychosis also had arteriosclerosis and the mental symptoms antedated the accident; hence the case was not diagnosed as traumatic psychosis.

Among the fourteen patients with fracture of the skull and brain injury were two who had meningeal hemorrhage; two had subdural hematomas and four had cerebral hemorrhage; that is, apoplectic rupture of an intracerebral vessel. There is no record in this series of patients with meningitis or abscess, for the good reason that I am dealing with chronic cases and not with acute brain injuries and because patients with those complications generally die. The patient whose only sign was loss of a sense of depth, of spatial orientation, very likely had a discrete hemorrhage into the left occipital lobe on the lateral side.

Although the single instance of traumatic psychosis in the series does not justify any conclusions, a few general remarks may not be out of place. The literature on the subject is neither very extensive nor convincing. Adolph Meyer [4] wrote of mental disorders following trauma to the head many years ago, and quite recently Gordon [5] made a study of the subject. The impression gained is that there is considerable laxity

TABLE 4.—*Sequelae*

Sequela	Number of Cases
Subjective complaints	74
Convulsions	8
Some degree of organic mental defect	11
Considerable mental deterioration	3
Conduct disorder	2
Psychosis	1
Loss of sense of depth (spatial disorder)	1

in the use of the term traumatic insanity. It seems to me that such symptoms as delirium, excitement and disorientation, whether brief or prolonged, occurring in the acute course of skull fractures and brain injuries, cannot be included in the psychoses under discussion, any more than the acute delirium of typhoid, for example. Nor, properly speaking, should aphasia, or mental deterioration with memory defect, sometimes seen in children and less frequently in adults, be included, for the reason that we are dealing with brain defects and not true psychoses. It is a moot point, too, whether the deterioration in epileptic patients is secondary to the convulsions or the trauma. The question really reduces itself to whether trauma to the head can cause a manic depressive state, a schizophrenia, a paranoia or a melancholia. This is doubtful; but if trauma may precipitate a psychosis, the injury need not necessarily be to the head. Whether head trauma can precipitate dementia paralytica, alcoholic insanity or a psychosis based on cerebral arteriosclerosis is quite another question.

The incidence of convulsions following trauma to the head presents another debatable question. The present series is entirely too small to permit of generalizations. The fact that it occurred in eight of 100 cases of all kinds and out of twenty-six patients with evident organic brain injury is of significance but still does not justify conclusions. As a matter of fact, there is

TABLE 5.—*Diagnoses*

Diagnosis	Number of Cases
Traumatic hysteria	37
Hysteria and malingering	2
Malingering	1
Hysteria and concussion	17
Traumatic neurosis	5
Traumatic encephalopathy, concussion	11
Convulsive state	8
Fracture of the skull with brain injury	14
Fracture of the skull without brain injury	4
Traumatic psychosis	1

a wide divergence of opinion on the subject, and the results of statistical studies are so far apart that it is difficult to set up any criteria. Turner's [6] figures are less than 5 per cent out of a total 18,000 cases of gunshot wounds of the head. The statistics of Muskens [7] are difficult to evaluate and hence they are not reliable. Sargent's [8] figures are not quite conclusive, Wagstaffe [9] cites the incidence as only 2 per cent. Collier [10] found an incidence of from 5 to 8 per cent, whereas Steinthal and Nagel [11] give an incidence of 29 per cent. Glaser and Shafer [12] cite sixteen cases and reckon the incidence at 6 per cent; but if one deducts the seven cases of hystero-epilepsy, the percentage falls to 3.5. The point is that the cases studied are not comparable and the materials, no less than the observers, vary to such an extent that it is difficult to find a common basis for reckoning percentage incidence. One thing that all observers are agreed on is that there must be definite injury to the brain and that a time interval of not less than two months must elapse between the receipt of the injury and the onset of convulsions. Whether it is fair to stretch the interval to ten, fifteen and more years is a matter of opinion. Another debatable point is whether trauma to the head, not necessarily severe, can call forth convulsions in a "potential epileptic." The difficulty here is that no one can define the term potential epileptic patient.

CLINICAL CLASSIFICATION OF POST-TRAUMATIC SYNDROMES

If we do not consider the patients in this series who had objective signs of brain injury and those who gave definite evidence of brain damage or defect in the

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5. Gordon, Alfred: Delayed Mental Disorders Following Cranial Traumatism and Their Pathological Interpretation, J. Nerv. & Ment. Dis. **77**: 259-273 (March) 1933.
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7. Muskens, L. J. J.: Epilepsy, Baltimore, William Wood and Company, 1928, pp. 275-370.
8. Sargent, P.: Some Observations on Epilepsy, Brain **44**: 312-328 (Nov.) 1921.
9. Wagstaffe, W. W.: The Incidence of Traumatic Epilepsy After Gunshot Wounds of the Head, Lancet **2**: 861 (Oct. 27) 1928.
10. Collier, J.: Lumleian Lectures on Epilepsy, Lancet **1**: 587 (March 24); 642 (April 7) 1928.
11. Steinthal, K., and Nagel, A.: Die Leistungsfähigkeit im bürgerlichen Beruf nach Hirnschüssen mit besonderer Berücksichtigung der traumatischen Epilepsie, Beitr. z. klin. Chir. **137**: 361, 1926.
12. Glaser, M. A., and Shafer, E. P.: Skull and Brain Trauma, J. A. M. A. **98**: 27 (Jan. 23) 1932.

nature of convulsions, mental deterioration or other signs and symptoms, there remains a group of individuals who, following a blow to the head, complain of subjective disturbances which are difficult to evaluate. They are practically the same in all cases, no matter what the underlying basis or explanation. They consist essentially of headache, dizziness and impairment of memory or lack of power of concentration and fears and anxieties, vasomotor disturbances, tremors, impairment of vision, inability to work and a host of other complaints. The dizziness in most of the cases does not represent an obvious vestibular reaction; certainly it is not the true vertigo which is accompanied by nystagmus, past-pointing, falling, or nausea and vomiting. The tremors and other objective signs are found on close examination not to be organically determined, while the impairment of memory is found to consist of lack of attention rather than of a true defect. It is important to emphasize that in the vast majority of the cases it is impossible from the description of the symptomatology alone to make a differential diagnosis. It is imperative, therefore, to seek other criteria and other diagnostic aids and, if possible, to arrive at some common understanding.

To add to the difficulties, many clinicians use different terms for the same condition or the same term for different conditions. One finds the diagnosis of traumatic hysteria and traumatic neurosis used interchangeably and indiscriminately, and the diagnosis of concussion is capriciously applied to clinical syndromes which neither from the history nor from the symptomatology can be differentiated from the other two. The term traumatic encephalopathy, though pathologically correct, has added somewhat to the general uncertainty, and so has the lack of use or the indiscriminate use of the encephalogram. Not that the term as well as the diagnostic method is not extremely valuable, but they need more specific definition and particularly more definite correlation with other facts. I would therefore, without introducing new concepts, submit the following classification of the syndromes in cases of head injuries in which the symptomatology is essentially psychic or mental. The criteria are based on theoretical and clinical considerations and on the analysis of cases as seen by the neurologist and psychiatrist.

1. *Malingering.*—True and unalloyed malingering is probably the least important and certainly the least common of the syndromes following head injury. Out of the hundred cases under analysis there was but one with outright simulation and only two patients who, in addition to their hysterical symptoms, gave some evidence of malingering. The rarity of the condition accords more or less with general experience, and it is well known that malingering is more common with regard to the psychoses than the neuroses. The statement as to the comparative rarity of flagrant malingering must be qualified, however, by the observation that in practically all post-traumatic syndromes there is the tendency to overvaluation of symptoms, to preoccupation with symptoms, to exaggeration of complaints and to a desire to shift responsibility from oneself onto others. Even patients with definite signs of brain injury are apt to show psychogenic coloration of symptoms. Up to a certain point all this may be regarded as almost normal, particularly if one takes into account the ready suggestibility of most people. The individual becomes a malingerer only when he consciously and purposely, in order to deceive, to evade responsibility or to derive gain, feigns illness and voluntarily tries to reproduce signs and symptoms which he really does not have or extravagantly exaggerates minor ones which he has. This is not the place to enter into a discussion of the diagnostic criteria of malingering. The diagnosis, while generally not difficult to make, sometimes is extremely so and often taxes the ingenuity of the most expert. Suffice it to say that, whereas in the neurotic the symptoms are unconsciously determined, in the malingerer they are always conscious impostures. Nor can the histrionic simulation occasionally seen in hysterics be classified as malingering, although the hysterical patient can also be a malingerer. Malingering invariably occurs when the trauma is slight and the initial symptoms minimal.

2. *Traumatic Hysteria.*—This is the most common sequel of head trauma that is not accompanied by gross evidence of organic brain injury. The diagnosis was made outright in thirty-seven of the cases under analysis; in two others there arose the question of simulation in addition to the hysteria, and in seventeen others, in which the history of unconsciousness also justified the diagnosis of concussion, there was a definite hysterical superimposition. Altogether, this sequel was present in 56 per cent of the entire series, and, if the seventy-four patients with subjective complaints alone are considered, the percentage mounts to 75.

The diagnosis of traumatic hysteria must be based on one set of negative and one set of positive criteria. Patients falling in this group give either no history of unconsciousness or only a history of very brief loss of consciousness, show no clinical signs of brain injury, no evidence of fracture on the x-ray plate, no history of subarachnoid bleeding in cases in which a spinal tap was done, and, in cases in which grave doubts as to diagnosis justify an encephalogram, no evidence of a cerebral pathologic condition. Merely negative evidence, however, is not sufficient, and the diagnosis cannot be made by exclusion alone. There must also be positive evidence that the trauma called forth psychogenic symptoms; that there is a hysterical reaction in an individual who has an underlying neurotic personality make-up. The patient makes unconscious use of the trauma to solve personality difficulties. The accident brings to a head a series of inner and outer conflicts which the patient was unable to face squarely or to solve adequately. The trauma precipitates the neurosis, sets in motion the same mental mechanisms as in any other hysteria and serves as a convenient solution of industrial, social, marital, familial or psychosexual conflicts. It should be emphasized that the individual is not consciously aware of the mental mechanisms; when he is, one is not dealing with hysteria. Nor must the litigation motif be paramount. Not that litigation and compensation do not play some rôle; but when they play the chief rôle or become the sole cause for the perpetuation of symptoms one comes dangerously close to malingering. The trauma may therefore be regarded as a definite precipitating and, in this sense only, as a causative factor. It is interesting to note that compulsion and obsessional neuroses are never, or rarely ever, precipitated by head trauma.

3. *Concussion or Traumatic Encephalopathy.*—This occurs in a fairly large percentage of patients suffering trauma to the head. In eleven cases in the series the diagnosis of encephalopathy was made outright and in seventeen a diagnosis of concussion plus hysteria was made; that is, a total of 28 per cent. In every case there was a history of more or less prolonged unconsciousness. The symptoms were entirely subjective in

all of them and in but few more were there even minimal clinical signs of organic disease of the nervous system.

There is an increasing tendency to speak of concussion of the brain in terms of traumatic encephalopathy; in fact, the two terms are beginning to be used interchangeably. There is no doubt that the old definition of a molecular disturbance does not hold any longer. The presence of minute hemorrhages, glial changes, cell and fiber degeneration, disturbed dynamics of the cerebrospinal fluid within the skull, ventricular distortion, and brain atrophy justifies the designation of traumatic encephalopathy. Martland's [13] work on brain changes in prize fighters threw great light on the subject. The investigations of Foerster and Penfield [14] and of Bielschowsky [15] also added to the knowledge. More recently Rand and Courville [16] have studied the effect of head trauma on the fiber system of the brain. The encephalographic studies of head injuries by Friedman [17] and others have shown the extent of ventricular and brain changes in patients whose main complaints were of a subjective nature. Kennedy [18] has laid down a few excellent criteria for the appraisal of the effects of head injuries. Without citing further references to the literature it may be emphasized that concussion is not a simple process and that it consists of fairly definite pathologic changes consequent on trauma to the head, which is accompanied by unconsciousness at the time of the accident. The diagnosis of concussion or encephalopathy is beginning to depend, therefore, more and more on other criteria than on those furnished by the symptomatology. In itself this differs in no wise from that of traumatic hysteria. One must rely chiefly on the history of prolonged unconsciousness, on the presence of "small signs" of neurologic involvement, on the absence of psychogenic causal factors, on the persistence and severity of symptoms, and on the evidence furnished by the encephalogram when other facts are not sufficient to establish a positive diagnosis.

4. *Traumatic Neurosis.*—This is, in my opinion, a comparatively uncommon condition. I made the diagnosis in but five of the hundred cases of head injury. The correctness of the statement as to its infrequency obviously depends on the acceptance of certain criteria for diagnosis. If traumatic neurosis and traumatic hysteria are used synonymously and interchangeably, the terminology is not only confusing but rests on sheer caprice, in which case one of the terms should be discarded. If, on the other hand, one is dealing with two distinct neurologic entities, as I believe to be the case, then it becomes incumbent to delimit them and, if possible, to adhere to a more strict definition of each term.

The clinical syndrome of traumatic neurosis differs little from that of hysteria but is not dependent, as far as one can tell, on the unconscious use of the accident to solve difficulties that have nothing to do with the trauma. That is, one is not dealing with a patient who had a neurotic personality to begin with. As far as possible the existence of concussion or traumatic encephalopathy must also be excluded. This leaves a small group of previously well adjusted individuals, who, following a serious threat to life, in which there was comparatively mild or even trifling injury to the head, beget a stubborn set of symptoms which are not amenable to suggestive therapy or other forms of psychotherapy. Their condition bears resemblance to some of the war neuroses of soldiers who had been through particularly harrowing experiences, which they subsequently relived in their dreams. To use a psychoanalytic explanation, there is narcissistic regression, but the ego instincts rather than the psychosexual instincts are affected. Traumatic neurosis might possibly be grouped with the true or actual neuroses, in which neurasthenia, anxiety neurosis and hypochondriasis are included, but the intrapsychic conflict with regard to the ego or self-preservation instincts, which is assumed to exist in traumatic neurosis, would argue against its inclusion. Whatever the explanation, the fact remains that there is a small group of patients, without demonstrable cerebral pathologic changes, in whom hysterical mechanisms cannot be demonstrated, in whom compensation or litigation does not play a predominant rôle, who are resistive to treatment and who find it difficult or impossible to return to their occupation at which they sustained the accident. It is to this group that the diagnosis of traumatic neurosis may be correctly applied.

CONCLUSIONS

There are so many pitfalls in the proper evaluation of signs and symptoms following trauma to the head that it is often difficult to arrive at a conclusion or to express an opinion with definite assurance. This holds true to some extent in cases showing definite evidence of brain injury, but it is particularly true of those manifesting subjective syndromes. It is agreed that trauma to the head is fraught with grave possibilities and serious consequences and that prolonged unconsciousness, even in the absence of skull fracture or objective signs of brain injury, may be followed by incapacitating sequels lasting months and years. However, it may be stated that, with few exceptions, signs of injury to the nervous system set in immediately or within a few hours, more rarely a few days, after the accident. Mental symptoms, particularly headache and dizziness, may set in later, and convulsions may appear months or years after the receipt of head trauma. Generally, the longer the interval the more difficult it is to establish a causal relationship between trauma and its alleged sequels. In rare instances the already existing pathologic changes of dementia paralytica, alcoholism and the convulsive state may be aggravated by trauma, but they may also be responsible both for the accident and for the injury. Though very difficult, it is essential in all cases to determine the exact amount of brain injury and the degree of psychic coloration of symptoms that is present in most instances. In doubtful cases, but not as a general routine, encephalography is of great diagnostic help. As this procedure is always unpleasant and occasionally not without dangers, it should be resorted to only as a last measure and with due discrimination.

Clinically it is not easy to differentiate the subjective complaints which follow in the wake of the vast majority of cases of trauma to the head, and it is often impossible to state from the symptomatology alone what the nature of the syndrome is. Every case, therefore, requires not only special evaluation of signs and symptoms but also personality studies. In view of

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14. Foerster, O., and Penfield, W.: The Structural Basis of Traumatic Epilepsy and Results of Radical Operation, Brain **53**: 99 (July) 1930.
15. Bielschowsky, P.: Disturbances of the Spinal Fluid System in Head Trauma, Ztschr. f. d. ges. Neurol. u. Psychiat. **117**: 55 (Nov.) 1928.
16. Rand, C. W., and Courville, C. B.: Histologic Changes in the Brain in Cases of Fatal Injury to the Head, Arch. Neurol. & Psychiat. **31**: 527-555 (March) 1934.
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the existing differences of opinion, of the lack of knowledge and agreement as to the nature of the underlying pathologic changes, and of the confusion in terminology, a tentative classification of post-traumatic syndromes is suggested and the criteria for their recognition are discussed. The syndromes are: (1) malingering, (2) traumatic hysteria, (3) traumatic encephalopathy or concussion, and (4) traumatic neurosis.

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ABSTRACT OF DISCUSSION

Dr. N. W. Winkelman, Philadelphia: As has been shown, malingering is not common, and even hysteria is not as common as customarily thought. In a study of a large series of cases histologically I have been surprised to find changes in the brain that were indisputable. In many of these, hysteria had been considered as a diagnosis. One is surprised to see in a group of post-traumatic cases a unanimity of complaints, as though the patients had rehearsed the symptom complex with one another. That is a statement which has been made for many years, that patients, no matter how ignorant, after head trauma complain of a group of symptoms that conform to the general group. That in itself is a remarkable thing. It is not only the trauma, it is the immediate handling of the trauma case sometimes that produces the after-results. When one says that a trauma is mild and that the patient was unconscious for five or ten minutes, I don't believe one is giving the entire story. I should like to know what the treatment of that patient has been. Edema following even a mild concussion may provoke an anoxemic condition in the brain, similar to anoxemia from any cause. So it is not only the trauma but the handling of a patient afterward that determines what will happen to that brain, the most sensitive organ of the body, an organ that degenerates with a loss of blood supply in eight minutes and completely degenerates in less than fifteen, something that physicians are sometimes a little lax about remembering. I have found in a study of many trauma cases, months and years after, indisputable evidence that trauma to the brain has produced a change—I would not use the term molecular—that can be recognized, a change that is capable of producing symptoms, mental and neurologic. When clinical diagnoses keep pace with advances in the other phases of neurology, I believe that eventually neurologists will be able to pick out those cases which will show under the microscope changes that any one can recognize.

Dr. George B. Hassin, Chicago: Trauma is probably a more frequent cause of peripheral and central nerve disorders than such common factors as infection or intoxication. It should therefore be considered among possible causes of those individual pathologic conditions of the nervous system in which the etiology may be obscured by a forgotten injury. Falls, electrical shocks, blows, jarring of the body produced by sudden stoppage of a fast moving train or car, and similar causes may bring forth a great variety of disorders of the nervous system conveniently classified as post-traumatic syndromes. One such classification has been offered by Dr. Wechsler. The majority of syndromes he mentioned used to be described as functional, as traumatic neuroses. At present, they are practically all organic. That is to say, they show under the microscope demonstrable changes in the nervous system, excepting the classic cases of hysteria and malingering. I should add to these two conditions so-called compensation hysteria, which however, like malingering, is not a morbid entity. In compensation hysteria an individual worries over a possible unfavorable outcome of his claims, while a malingerer consciously tries to deceive the examiner by exaggerated and unjustified complaints. Another important group of post-traumatic syndromes comprises mental disorders. In the majority of cases it is not possible to establish an organic basis for so-called traumatic psychoses, but with the perfection of the methods of neuropsychiatric research it will probably be possible to prove that even psychoses may be caused by trauma.

Dr. Temple Fay, Philadelphia: Dr. Wechsler has presented a valuable summary and classification of post-traumatic syndromes. The problem of brain trauma involves a surgical principle concerning repair of damaged tissue. A wound, chronic ulcer or bedsore presents the same problem. The surgical principle underlying repair and maintenance of living tissue, brain or otherwise, demands that the maximum amount of circulation, nutrition and oxygen must be made available and maintained at all times. Following a cerebral commotion there is anemia, edema and pressure. Nature attempts to induce a hyperemia so as to assure oxygenization and nutrition to the injured part. Pressure rises as a result of the increase in blood volume, and compression anemia follows because the skull cannot expand to permit this congestion at one point without the sacrifice of necessary circulating blood volume in another. The cranial total volume remains fixed. The addition of a new factor means the equal subtraction of another. The brain is an organ that happens to have a more complex expression of symptoms but, nevertheless, it is dependent on adequate oxygen and nutrition for its survival. One cannot get blood, oxygen and nutrition back into the cranial cavity unless one makes room for it. Decompression, spinal drainage and dehydration permit additional space temporarily for the return of a nutritional blood supply necessary to maintain the function of the organ and prevent the final symptoms of anemia and softening. In the last ten years, 837 cases of head injury have come under my observation. I attempt to maintain the initial surgical principle by continued dehydration so as to promote the maximum circulation to the brain at all times at the expense of the less important elements, primarily spinal fluid volume. I have found that many of the post-traumatic syndromes described appear and disappear as the tide of the blood (nutrition and oxygen) rises and falls. After spinal drainage (or an encephalogram), and continued fluid and dietary limitation, these patients are definitely improved. Ninety-two per cent of a recent series on this program have been free from post-traumatic symptoms and able to return to work in three months. In the last analysis the function of the brain as an organ depends on adequate nutrition, and many of these vague post-traumatic symptoms are due to a chronic cerebral anemia. I am convinced that these symptoms may be prevented or controlled if measures are employed to maintain an adequate blood supply during and after the phase of the injury. I have found that careful and continued "dehydration" is required to obtain this end.

Dr. J. L. Fetterman, Cleveland: Practically all modern writers on the subject are in accord with the author and with Drs. Hassin and Winkelman, that an organic basis underlies the emotional symptoms following head injury. However, there are some dissenting views. Reichardt, for example, disagrees. In a thesis that most of the neuroses following trauma are conditioned by the factor of compensation, Reichardt includes even many who have suffered cranial injury. He excludes cases of severe cerebral trauma, such as intracranial hemorrhage, contusion of the brain and subdural hematoma. He believes that the remainder, many of the concussion cases, are influenced in their emotional symptoms by the factor of insurance. He cites the experience that among the uninsured and in the preinsurance era, patients who suffered concussion of the brain cleared up in a remarkably faster time than do those who are insured. Dr. Wechsler did not emphasize underlying motives as responsible for neuroses after trauma to regions other than the cranium. In the traumatic neuroses of industry, for example, there are patients whose symptoms can be interpreted only as an escape from duties that are disagreeable, dangerous or as revenge against an employer. This constitutes an occupational type. In civil life one encounters patients whose neuroses in their onset, development or disappearance reflect a claim for compensation. This is an indemnity type. In my experience the attitude to industry or toward compensation may be the dominating factor behind the symptoms of the neurosis. With reference to head trauma in children, Beekman wrote that post-traumatic sequelae were decidedly less common than among adults. Does Dr. Wechsler explain this difference on an anatomic basis or does he subscribe to the view of Davis, who discussed Beekman's paper? Davis suggested that it wasn't so much a physical difference as a psychic one: children are less subject to social and economic motives, less influenced by "gain from illness" than adults.

DR. GEORGE W. HALL, Chicago: I have been interested in this subject for a long time. How many persons have not been knocked unconscious at one time or another? The difficulty in evaluating cases of trauma to the central nervous system is that these tabulations as expressed by the author come from a specialist who has seen only the severe cases after they have been milled over, so to speak, by other physicians. Consequently many cases escape his notice entirely, even though the patient may have been rendered unconscious at some time. It is difficult to arrive at the proper conclusions from a statistical standpoint on which any classification can be made. There is no doubt in my mind that, as Dr. Wechsler says, in many cases the desire to escape from the difficulties of life is an important factor, if one can study these cases as they come. Another point I would like to make is that recently there has been entirely too much stress placed on the possible changes shown in an encephalogram. I know of a clinic in this country that desires to make encephalograms in every case of brain injury or injury to the skull, which of course I think is a mistake. The relative importance of an encephalogram is not known as yet. There are very few men in this country who can read an encephalogram with the proper degree of accuracy. Consequently in my opinion the importance of an encephalogram is too strongly emphasized. It brings about the old statement that one should not allow the laboratory to make the diagnosis. Another point brought out by one of the discussers is that children do not suffer the after-effects of these injuries simply because (and this is based on Dr. Wechsler's statement) the child desires to go on and play, he does not want to quit, and consequently he makes a very good recovery, whereas the individual becomes, of course, more profoundly neurotic after the injury if there was a predisposition to neurosis. There can be no question that there is a connection sometimes between brain injury, especially a basal skull fracture, and the possibility of developing other diseases. Not so long ago I had the privilege of seeing a case of basal skull fracture in which meningitis developed within a period of three or four days. The meningococci were found and the serum was used. The patient made a complete recovery. I think that Dr. Wechsler's classification is a good one, and his percentage is very encouraging, in view of the fact that he sees these cases after the average practicing physician has not been able to solve the problem.

DR. WALTER FREEMAN, Washington, D. C.: There is a tendency in some locations, Washington for one, toward a great increase in the number of claimed disabilities under workmen's compensation acts, and there has been a tendency on the part of some physicians to claim that the neurosis itself, in the absence of a traumatic encephalopathy, is a disabling disease. It seems to me that this is a very radical view and I should like to have Dr. Wechsler's reaction to it.

DR. MAX H. WEINBERG, Pittsburgh: I agree with Dr. Wechsler. It is unfair to discuss his paper more or less critically, because he could not give his paper in its entirety. This is one of the saddest and most pressing problems that neurologists have to put up with. Opinions differ sharply about these patients, but is it a mistake to give them so much attention? The question Dr. Winkelman raised especially is interesting. It is significant how some of the most ignorant people give definite symptoms, as though they had read the books on the subject. There must be some reason for patients complaining of the same symptoms, such as dizziness, especially on bending; severe headache, with exacerbations, and loss of memory. It is this group that is most disputed. What are neurologists going to do about these cases? It is all well enough to postulate that as soon as the litigation is over everything is going to be lovely with the patient, but this is found not to be so. The dehydration treatment, in accordance with principles laid down by Dr. Fay, is particularly valuable in this type of case and prevents many such sequelae. Dr. Wechsler rightfully stressed that the results do not depend so much on the extent of injury or the amount of the force but that it is a question of what happens to the brain and, as it seems, a great deal does happen. There is no doubt, however, that the question of personal equation does come in. I, for one, have dropped the term "traumatic neurosis" altogether in the last three years. I refer to these cases, once they present this group of symptoms, as head injury syndromes. With careful scrutiny, one will always find some organic cerebral changes. I therefore wish to emphasize that these head injuries are very serious as far as efficiency is concerned. I should like to ask the program committee in the future, when arranging for this kind of paper, to make an exception in the case of the original discusser and extend his time so that all of us can arrive at a fairly definite conclusion about these cases.

DR. C. C. NASH, Dallas, Texas: There is one question I should like to ask as a neurologic surgeon and not as a neuropsychiatrist. In testifying in court, how is one going to differentiate between traumatic hysteria and malingering? It is one thing for a medical organization to say that a man is a malingerer, but to get on the witness stand and say that this man is a malingerer and that there is nothing the matter with him, as I have learned from sad experience, is something one had better not do unless one is absolutely sure of oneself. Recently I had a court experience in which a man claimed to be paralyzed from a stroke of apoplexy resulting from sunstroke. His left leg and left arm were supposed to be paralyzed, and he walked in on a pair of crutches dragging his foot. He walked on his crutches, supported his weight, and had corns on the bases of his hands. The attorney asked me if I would say this man was a malingerer. I said, "No. I couldn't find anything the matter with him; that was all." Needless to say, the jury didn't believe me. They gave him total disability. The compensation laws in Texas provide that the man must be able to be returned to the same or similar occupation in which he was engaged at the time of the injury. He might be the finest stenographer in the world and be able to do that kind of work, but if he worked as a day laborer at the time of his injury he has to be paid total disability if he cannot return to that kind of work.

DR. E. E. MAYER, Pittsburgh: As well as Dr. Wechsler could be followed in the incompleted reading of his paper, I gather that he is dealing only with residual syndromes. Most of the discussion seems to me, therefore, inappropriate in that acute and chronic cases are not separated. My experience is that the acute syndromes directly following head trauma differ from the chronic forms. I cannot find in hysteria that is connected with head trauma anything that differs from hysteria without head trauma. I cannot reconcile myself, therefore, to Dr. Winkelman's argument that cases of hysteria present brain changes, even if no clinical symptoms of an organic nature are present. Wherein does the distinction lie between hysteria without concussion and hysteria with concussion? The unrehearsed likeness of the complaints is not a proof of a common pathologic background but only a proof of a similarity in human nature in its mental mechanisms. Hysterical symptoms are compromises serving to conceal the real sources of a psychic conflict, whether they occur with trauma or without trauma of a physical kind. The seeming uniformity of the psychology of the neuroses in the traumatic group is, however, more apparent than real, and it is still necessary to study individual differences. There is a group in which organic injury occurs and yet is mistakenly considered to belong to the traumatic neuroses. Mild as well as fugitive and transitory disorders of taxis and praxis must persistently be looked for and often will be found if patients are under continuous scrutiny. A transitory diplopia, a fragmentary amnesia or an actual thalamic type of pain is not uncommon. Particularly with the patient who has vertigo and who is not neurotic, or the patient who complains of petit mal seizures, will a thorough study often reveal that the post-traumatic state is on an organic basis. And I need hardly remind this group that the pathologic condition is sometimes found to be on an arteriosclerotic basis and not actually but only seemingly, through close association, a post-traumatic one. Classifications are largely personal, and if Dr. Wechsler gets satisfaction in his clinical work from the four-phase classification he has given, it need not follow that it would serve as satisfactorily for others. Neurologists still differ too much in the meaning of their cases, largely because of incomplete grasp of basic physiologic principles in connection with the brain, to classify one from the other.

DR. I. S. WECHSLER, New York: While I agree with Drs. Winkelman, Hassin and Fay about the pathologic changes in certain types of brain injuries, I am more concerned with the group the symptomatology of which is so uniform and the

classification so difficult. The very profusion of terms used by the discussers bespeaks our confusion. We speak of compensation neuroses, litigation neuroses, hysterical neuroses, traumatic neuroses, traumatic neurasthenia, concussion, encephalography, ego neuroses, malingering, and what not. The question is, Are the criteria I suggested acceptable? It is facetiously said that, when a brick falls on a man's head, the first question he asks on coming to is not what happened to his head but to whom the brick belongs. None the less I feel that outright malingering is not very common, provided one adheres to a very strict definition. Compensation or litigation as the predominating motive comes very close to the malingering. In the second or traumatic hysteria group the patients utilize trauma as an unconscious excuse for the solution of personal problems. Hence the need of personality studies. In the traumatic neurosis group one deals with a different personality, with a different ego reaction, albeit an identical symptomatology. Finally there is the group of patients who undoubtedly have brain changes, however minute. I agree with Dr. Hall that the encephalogram should not be used indiscriminately. It is not always harmless and it always is unpleasant. The word "concussion" will have to be redefined or discarded when more is known about encephalopathy, it may be used as a substitute. The point is to agree on definitions and classifications, however tentative. As to trauma in children, I find that children either do very badly or very well. They recover better than adults or show more residual defects, especially retardations. To answer Dr. Nash, I agree that if a patient utilizes compensation and litigation to perpetuate the neurosis he is malingering. As the study refers to post-traumatic conditions, I purposely left out acute injuries. May I reiterate that in my experience traumatic psychosis is extremely rare. What I have in mind is a true post-traumatic organic psychosis due to actual injury of the brain and not an emotional or other psychosis precipitated by trauma.

INFECTIONS BY GAS-FORMING ANAEROBIC BACILLI

AN ANALYSIS

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INDIANAPOLIS

The present state of our knowledge concerning infections caused by anaerobic gas-forming bacilli is one of confusion. This is no doubt due to the fact that any lesion characterized by the presence of gas in the tissues, together with large gram-positive bacilli, is considered to be gas gangrene. Apparently in most cases neither the history of the infection, the clinical course nor the kind of gram-positive bacteria present alters the diagnosis. The great number of unsound tests that are still being used to determine the presence of Clostridium Welchii (the Welch bacillus) is another factor that does little to aid in clarifying the present situation.

All bacilli that grow in the absence of oxygen and form spores are grouped in the genus Clostridium, of which at present about 100 members are classified. Nearly all these organisms form gas in certain situations; but this is not a great factor in their classification, since the aerobic colon group and the streptococci also form gas and frequently do so in infected tissue. Of the 100 species of anaerobic spore-forming bacilli, seventeen are pathogenic for some form of animal life, whereas only seven are in the true sense pathogenic for man. Of these seven, Clostridium tetani is probably most important. It is the cause of tetanus and is familiar to all. Clostridium botulinum, the agent responsible for food poisoning, since the advent of adequate methods of processing of canned foods, is no longer an urgent problem and seldom is encountered. The remaining five species of pathogenic organisms constitute the group that is responsible for malignant wound infections attended by edema, necrosis, toxemia and collections of gas, such as were seen so frequently during the World War.

Clostridium Welchii is the most important member of this group of five organisms. At present it has eleven synonyms, the most frequently used of which are Bacillus perfringens, B. Welchii and the gas bacillus. This organism is a short, thick, capsule-bearing rod with truncated ends (square, with rounded corners), which produces a filtrate of highly varying toxicity and hemolytic action. It was found as the only organism in 14 per cent of gas gangrene in war wounds. Together with other anaerobes it was found in 65 per cent. This shows that it played the major rôle, i. e., 79 per cent, in causing the emphysematous or most virulent type of gas gangrene in the World War. The next most frequent invader and probably second to Clostridium Welchii in toxicity is Vibrion septique. There is still some uncertainty about the correct name for this organism. Bergey's classification considers Vibrion septique of Pasteur to be identical with the bacillus of malignant edema of Koch. The Standard Classified Nomenclature of Disease refers to them as different organisms and gives Clostridium septicum (Vibrion septique) as the cause of malignant edema. Bacteriologists, I think, will continue to consider Clostridium oedematiens-maligni as identical with both organisms of the Franco-German argument and ascribe to it the cause of malignant edema. The remaining three organisms, namely, Clostridium oedematiens (B. novyi), Clostridium histoliticum and less frequently Clostridium fallax are not often found and their identification is of no great importance to the clinician.

Gas gangrene is a clinical entity first described by Maissoneuve in 1853. During the Crimean War (1854-1856) the first series of cases was collected. Little was known of the etiology until Welch in 1893 described the organism that causes it. The typical picture of true Clostridium Welchii infection varies in severity with the portal of entry and the virulence of the infecting organism. In the cases of puerperal sepsis reported by Toombs and Michelson,[1] the mortality rate was 95 per cent. They were fulminating infections characterized by jaundice in more than 50 per cent of the cases, marked leukocytosis, usually from 25,000 to 90,000, rapidly developing secondary anemia, low hemoglobin and high fever. About 50 per cent of these patients were dead in forty-eight hours, only a small percentage living past the fifth day. True Clostridium Welchii infections of the extremities give a similar but somewhat milder clinical picture. The death rate during the war was about 50 per cent, whereas the series of cases from medical literature that I studied and that occurred during civil life showed a death rate much higher.

The toxicity of various strains of the four types of Clostridium Welchii is variable, testing sometimes as low as 1. In this laboratory, efforts to verify the reports that there are nontoxic strains of this organism have been unsuccessful. All strains studied here that fulfilled the growth characteristics of Clostridium Welchii produced a filtrate that was hemolytic and toxic,

From the Research Division, Indiana University School of Medicine.

1. Toombs, P. W., and Michelson, I. D.: Clostridium Welchii Septicemia Complicating Prolonged Labor Due to Obstructing Myoma of the Uterus, Am. J. Obst. & Gynec. **15**: 379 (March) 1928.

usually to a high degree, testing from 1 to 4 to 1 to 7 [2] when fresh animal serum was added to the medium. Toxins were made by inoculating tubes of veal meat infusion medium, to which fresh animal serum had been added up to 10 per cent. The culture was passed through a Berkefeld candle after forty-eight hours, and the resulting filtrate was tested as described.

Medical literature, particularly in the last twenty years, contains many reports giving Clostridium Welchii as the etiologic agent in a wide variation of clinical conditions. Torrey and Kahn,[3] on the basis of experimental anemia in rabbits, produced by intramarrow injections of Clostridium Welchii toxin, claimed some similarity to primary pernicious anemia in man. Gordon-Taylor and Whitby,[4] after a study of fifty cases, concluded that Clostridium Welchii is usually associated with acute cholecystitis. They also found the organism in 13 per cent of all gallstones removed at operation. Jennings [5] finds Clostridium Welchii in the lumen of the appendix in 90 per cent of cases. Clostridium Welchii was reported by several to cause the toxemia of intestinal obstruction. Most of the foregoing work has been disproved. Many of the single case reports are not reliable. Of the cases that I reviewed, about one third were probably not true Clostridium Welchii infections. Cramp [6] in 1912 reviewed 187 cases occurring up to that time, including twenty-five of his own. Of these 187 cases, approximately 30 per cent, in the light of more recent knowledge, were not Clostridium Welchii infections.

The most recent attempt to establish Clostridium Welchii as the cause of a different pathologic state is that of Andrews, Rewbridge and Hrdina.[7] These workers assert that the Welch bacillus is a normal inhabitant of the liver and muscles of normal healthy dogs and, in severe irritations of the peritoneum by sterile autolyzed liver suspensions or 10 per cent bile salt solutions, will migrate out, causing a bacterial peritonitis and death from B. Welchii toxemia. In 1931 Trusler and Reeves [8] reported on the bacterial flora of the livers and muscles of normal dogs. Since 1931 the complete work of Andrews and his associates has been repeated in our laboratory and an extensive study of the problem made by means of a more strict bacteriologic technic. A report of this experimental work has been accepted for publication by the *Archives of Surgery*. We were unable to duplicate the results of the foregoing experimenters but found that while the tissues, notably liver, spleen and muscles, of apparently normal healthy dogs regularly contained bacteria, Clostridium Welchii was not found to be present. Ordinary surgical cleanliness is not sufficiently accurate for the needs of this work and we believe that the results obtained by previous workers were due to contamination in the collection of the sample to be cultured or to incomplete cultural study of the organisms found.

Most of the experimental evidence and clinical conclusions linking Clostridium Welchii with conditions other than true gas gangrene have been based on unsound tests for the presence of this organism. The work of Jennings, and as recently as June and July 1934 cases reported by Orr,[9] are based on finding Clostridium Welchii by inoculating a rabbit intravenously with suspected material and then incubating it, after killing it by a blow on the head. Large gram-positive organisms were then recovered from the tissues of the rabbit. The same or a similar result may be obtained by killing and incubating a rabbit without inoculation. In 1927 Nerb [10] described a test whereby the presence of Clostridium Welchii could be detected as follows: Into the liver of a guinea-pig, 2 cc. of suspected material was injected, care being taken to traumatize the liver somewhat in the process. The animal was then killed by a blow on the head and incubated. If, after three hours of incubation, large gram-positive gas-forming bacilli were found in the peritoneal fluid, B. Welchii was considered to be present. Unfortunately, if 2 cc. of sterile saline solution is injected into the liver of a guinea-pig in the same manner, large gram-positive gas-forming bacilli are usually found in the peritoneal cavity after three hours' incubation. Both procedures described are obviously worthless and misleading. A great number of cases reported are based on direct smear, which, in view of the morphologic similarity of these organisms, is utterly unreliable. Probably the most reliable single laboratory procedure is a capsule stain, since Clostridium Welchii is the only pathogenic anaerobic organism bearing a capsule. In our experience, reliable capsule stains are extremely difficult to make and this method of identification should be used only as an emergency measure and by technicians with considerable experience. Certainly before a case is reported or recorded in experimental work, strict anaerobic technic is necessary for positive identification.

If it is true that approximately one third of the infections reported as being due to Clostridium Welchii were incorrectly diagnosed as to etiology, the interesting question arises What is the real cause of such infections? In this connection a review of various series of cases reported as being gas gangrene shows that they are divided about equally among the following causes:

1. Those cases following compound fractures with attendant contamination from soil or street dirt.

2. Those due to gunshot wounds and crushing wounds of the extremities, wherein muscle is injured and contaminated by dirt or dirty clothing.

3. Spontaneous gas infections without a history of contamination, arising after clean surgery and the parenteral administration of drugs and solutions.

Not included in this division are the cases of puerperal sepsis caused by Clostridium Welchii that are due to attempts at criminal abortion or instrumentation, of which some 300 have been reported and doubtless many others unrecognized.

As previously mentioned, about 30 per cent of the 187 cases reported by Cramp would fall in group 3. Orr's cases referred to before were seven in number; four of the patients were over 50 years of age, two of the four had circulatory failure, and one had diabetes.

2. A test of 1 to 7 means that 1 cc. of the filtrate diluted to a total volume of 7 cc. with physiologic solution of sodium chloride will, when 1 cc. of the diluted suspension is injected intramuscularly, kill a 250 Gm. pigeon within twenty-four hours.

3. Torrey, J. C., and Kahn, M. C.: The Progressive Anemia Following a Single Intramarrow Injection of B. Welchii Toxins, Am. J. Path. **5**: 117 (March) 1929.

4. Gordon-Taylor, Gand, and Whitby, L. E. H.: A Bacteriological Study of Fifty Cases of Cholecystectomy, with Special Reference to Anaerobic Infections, Brit. J. Surg. **18**: 78 (July) 1930.

5. Jennings, J. E.: Relation of the Welch Bacillus to Appendicitis and Its Complications, Ann. Surg. **93**: 828 (April) 1931.

6. Cramp, W. C.: A Consideration of Gas Bacillus Infection, with Special Reference to Treatment, Ann. Surg. **56**: 544, 1912.

7. Andrews, Edmund; Rewbridge, A. G., and Hrdina, Leo: Causation of Bacillus Welchii Infections in Dogs by Injection of Sterile Liver Extracts or Bile Salts, Surg. Gynec. & Obst. **53**: 176 (Aug.) 1931.

8. Trusler, H. M., and Reeves, J. R.: Significance of Anaerobic Organisms in Peritonitis Due to Liver Autolysis, Arch. Surg. **28**: 479 (March) 1934.

9. Orr, T. G.: Gas Bacillus Infection of the Abdominal Wall, J. A. M. A. **102**: 2081 (June 23) 1934; Gas Bacillus Infection Following Clean Amputations, Am. J. Surg. **25**: 113 (July) 1934.

10. Nerb, Louis: A Method of Prompt Identification of Bacillus Aerogenes-Capsulatus (B. Welchii), S. Clin. North America **7**: 1021 (Aug.) 1927.

Case 17042 [11] from the Massachusetts General Hospital is a good example of group 3. Foreign literature especially contains numerous cases that fall in the third group. In 1931 a committee at the New York Hospital for Bone and Joint Diseases,[12] appointed to determine why gas infections appeared so frequently in amputation stumps after clean surgery, brought forth some interesting facts. The committee considered that all the gas infections were caused by Clostridium Welchii and then discovered that most of the infections appeared in arteriosclerotic individuals or patients past the age of 50, some of whom had thrombo-angiitis obliterans. These infections were mild, and recovery was the rule when the patients were in fairly good physical condition. As stated before, all series of cases, except war wounds, that I studied contain approximately one third that arise in patients past 50 years of age, in diabetic patients, in arteriosclerotic patients, and in patients with thrombo-angiitis obliterans or generalized circulatory failure. These infections may be spontaneous, follow amputations for dry or moist gangrene, and appear after the parenteral injection of drugs and solutions and after bruises in which the skin is not broken. The clinical picture, as compared with true Clostridium Welchii infections, is relatively mild, the temperature from 100 to 102 F., white blood cells from 10,000 to 15,000, no jaundice, and no hemolysis or secondary anemia. The infected part gives off a foul odor and contains foul smelling gas, the muscles are blackened or reduced to a thick black paste, the skin is bronzed or purple, and the hair does not pull out. The line of demarcation is usually prominent. In true Clostridium Welchii gas gangrene there is nearly always a history of trauma with contamination, it occurs in all ages, severe pain occurs at the site of the infections, and the temperature rises rapidly to 103 or 104. The white blood count ranges from 25,000 to 90,000, red blood cells may fall to 1,000,000 in twenty-four hours as the result of hemolysis, and some degree of secondary anemia is always present. Jaundice or a greenish pallor is present in more than 50 per cent of the cases. The patient perspires freely and is very toxic. The infected area is indurated and crepitant; the skin is often reddened but not otherwise discolored; the hair pulls out easily; the infected muscles are red; the wound exudes a red, hemolyzed serum and a gas, which does not have a putrefactive odor. Lines of demarcation are not prominent, since the gas infiltrates along the muscular planes at some distance from the site of infection.

I have recently seen the case of a boy who fell from a cherry tree and suffered a compound fracture of the humerus at the elbow joint, the proximal fragment being thrust into the soil. Open reduction was done and the wound closed tightly. Thirty-six hours later the muscles around the elbow were crepitant and forty-eight hours later the boy was extremely jaundiced and had a temperature of 104. Clostridium Welchii was recovered, with other organisms, from the wound and in apparently pure culture from the blood stream. Recovery followed amputation below the shoulder and the administration of 100,000 units of Clostridium Welchii antitoxin. Fortunately for the patient, the organism recovered was only mildly toxic, testing 1 to 2 in our hands.

11. Dwight, R. W.: A Lesson in Surgery plus Diabetes, New England J. Med. **204**: 172 (Jan. 22) 1931.

12. Gas Bacillus Infections in Amputation Stumps, Report of Committee, Hospital for Joint Diseases, J. Bone & Joint Surg. **13**: 577 (July) 1931.

The various pathogenic organisms that cause true gas gangrene are distinct species, belonging mostly to the saccrolytic group; they are similar in morphology to one another and to numerous species of putrefactive proteolytic bacilli, only a few of which have so far been classified. There are myriads of these putrefactive, gas-forming, anaerobic bacilli lying dormant in the soil, periodically growing on bits of decaying organic matter and thereby maintaining their numbers. These organisms constantly contaminate food and it has been shown experimentally that they utilize the tissues and organs of animals to continue their existence. Evidence has been and still is being accumulated in this laboratory to show that in the latter decades of a human existence the organs and muscles may become contaminated by these saprophytes and that under certain conditions they can begin the destruction of the tissues before death. We believe that the type of putrefactive gas gangrene appearing mysteriously in older people, and those suffering from diabetes, arteriosclerosis and circulatory failure, is caused by these saprophytic bacteria already present in the tissue injured or deprived of its blood supply. All that is necessary for their growth is death of tissue. In dogs known to harbor similar organisms in their tissues, putrefactive gaseous lesions may be produced by trauma to muscles or the injection of toxic substances. These infections readily respond to adequate drainage, resection of the dead muscle, and supportive care.

In human subjects, treatment should be directed toward improvement of circulation, control of diabetes and removal of dead muscle. Certainly radical amputations are not warranted and specific Clostridium Welchii antitoxin is useless. In true Clostridium Welchii gas gangrene, antitoxin seems to be most valuable as a prophylactic agent. When the infection is established, it becomes a therapeutic aid second only in value to its early prophylactic use and débridement.

SUMMARY

1. Approximately 30 per cent of cases reported and treated as Clostridium Welchii gas gangrene are caused by other anaerobic organisms.

2. This 30 per cent of cases should be classed as putrefactive gangrene and treated conservatively by systemic supportive treatment, débridement and irrigations. Clostridium Welchii antitoxin is not indicated and may be injurious.

3. Putrefactive gangrene is likely to appear in patients past the age of 50 years who are constitutionally below normal. Cases appear notably in patients with circulatory failure, arteriosclerosis, thrombo-angiitis obliterans and diabetes mellitus.

4. The direct cause for putrefactive gaseous lesions in the muscles of patients whose condition has been described may be bruises, burns, simple fractures, parenteral administration of drugs and solutions, and circulatory failure.

5. Putrefactive gas-forming anaerobic soil bacteria contaminate food at all times. It seems apparent that bacteria of this type are frequently present in the organs and muscles of the aged individual.

6. Diagnosis of Clostridium Welchii infection cannot be based on direct smear, the rabbit inoculation test or Nerb's test.

7. Diagnosis, for clinical purposes, of the presence of Clostridium Welchii can be made in experienced hands by capsule stains. However, the only positive

identification is by the use of anaerobic cultural methods and related criteria.

8. Patients suffering from wounds, particularly of muscle tissue, which have been contaminated with soil or street dirt, should be given gas gangrene antitoxin prophylactically and in addition should receive débridement and irrigations. If toxic symptoms develop, radical débridement, continuous irrigations and therapeutic serum are indicated without delay.

FROST-BITES AMONG EMPLOYEES OF THE CITY OF NEW YORK

DURING THE WINTER OF 1933-1934

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NEW YORK

Among the regular and temporary employees of the Department of Sanitation, there were 388 cases of frost-bite between December 1933 and March 1934. One hundred and twenty-eight cases were mild; the men lost no time from work and required but one treatment. The data on these 128 cases were not available for inclusion in this study, which is limited to the 260 remaining cases.

One hundred and eighteen men had frost-bitten ears, of which four resulted in disfiguring scars; one had a frost-bitten nose, which left no noticeable scar; 113 had frost-bitten hands and fingers, twenty of whom have permanent defects varying from limitation of motion in one finger to almost complete loss of use of the hand. Of forty-two frost-bites of the feet there are four with similar variations of permanent defects. The classification of permanent defect does not include patients who complained of recurrent swelling of the affected part, tingling and sensitiveness to cold, common complaints even among those who lost no time from work.

When an investigation into this condition was begun, it was supposed that the predisposing factors to injury by cold were high humidity, insufficient clothing, a long period of unemployment preceding the job as snow shoveler, previous indoor occupations, repeated freezing, age, physical fitness, preexisting disease and alcoholism. It was believed that slow thawing of the affected parts and early treatment might have avoided some of the poor end results. The data obtained indicated that these assumptions required modification.

The accompanying charts [1] show weather conditions in New York City from December 15 to March 15, the number of employees exposed and the number of frost-bite cases. The temperature and the wind velocity and the humidity on the graphs is the average of the first four hours of the usual working day. This period was taken because 75 per cent of the patients had symptoms after working four hours or less, 90 per cent had symptoms before the end of the working day, and the remaining 10 per cent did not have any symptoms except mild numbness till after they had gone home.

The single continuous line indicates the amount of snow on the ground in Central Park. On the city streets the snow remains much longer. A fair index of the amount of snow on the streets is the number of temporary snow shovelers employed. The double line indicates the total number of men employed in the sanitation department. There are 14,000 regular employees; additional temporary employees for snow removal increased the number as shown on chart 1 to a maximum of 54,000.

Chart 1 shows that frost-bite occurred on January 29 although there was little snow removal going on. The seasoned worker is susceptible and the presence of snow is not the important factor. On the days when snow was falling (indicated by rise in cumulative snowfall) there were fewer frost-bites than one might expect from the temperature and wind.

On chart 2 the ratio of the number of frost-bites to 10,000 men exposed is shown. This brings out more clearly that at temperatures below 8 F., regardless of other conditions, an incidence of five or more frost-bites may be expected (chart 2, December 29, 30, February 8, 9, 10). When the temperature is between 8 and 14, the incidence of frost-bite is high only when there is a strong wind movement; the temperature may fall as low as 8 without causing many frost-bites (February 17). When the temperature reaches 24 frost-bites rarely occur, no matter how strong the wind.

On the days when a large number of frost-bites occur, the humidity was never high (maximum 60 on February 20, chart 2). There appears to be no close relationship between frost-bite and humidity.

The significance of wind is seen on comparing December 29 and 30. On these two days the temperature was about the same; on the 29th the wind movement was 13 miles per hour and on the 30th it dropped to 5 miles per hour. There was a sharp decrease in the incidence of frost-bite. On January 29 and February 3 and 10 the average temperature was the same (8 F.) but on January 29 the wind movement was the highest of the winter (24 miles), while on February 3 it was 10 miles and on February 10 it was 14 miles per hour. The incidence of frost-bite on the windy day was nearly 8 for each 10,000 men exposed, while on the other two days it was less than 1. The humidity was about equal on the three days.

Most of these men were treated at the Department of Sanitation Clinic. The unexpected rush of cases did not permit general physical examination till some weeks after the onset, when all the milder cases had been closed. Among those with serious loss of part of the hands or feet, one had diabetes, one epilepsy, two myocarditis with circulatory insufficiency, one syphilitic endarteritis and one advanced arteriosclerosis. Moderate arteriosclerosis was not more frequent than usual in a similar group of laborers. Malnutrition evident on physical examination was found in two. All eight men, with underlying systemic conditions, were temporary employees.

RESULTS OF OBSERVATIONS

Duration and Repeated Exposure.—A history of the symptoms of frost-bite in the affected part, either within a few days or in previous winters, was rarely obtained. Repeated freezing was not a factor in these cases. MacCallum [2] states that repeated exposure for short periods does not produce necrosis but, instead, hyperplasia with giant cell formation in the epidermis. This condition was not observed in any of our cases.

Workers who continued several hours after the first feeling of numbness had the worst frost-bites. The length of exposure after the first symptoms develop is more important than any other single factor.

From the Division of Workmen's Compensation, Office of the Corporation Counsel of the City of New York.

1. The graphs of weather conditions are based on the data in the Report of the New York Meteorological Observatory, James H. Scarr, director, United States Weather Bureau.

2. MacCallum, W. G.: Text Book of Pathology, ed. 5, Philadelphia, W. B. Saunders Company, 1932, p. 363.

Thawing.—One patient with freezing feet went into a hot boiler room to get warm. He eventually lost two toes of his foot. This case, coming early in the series, gave us the impression that slow thawing was of the utmost importance. More careful investigation did not confirm this generally accepted idea. Many men with apparently severe frost-bites went into warm rooms without bad effect. In a large percentage of the serious cases the men were careful not to warm the freezing part rapidly, often going to extremes of caution in increasing the temperature slowly. A number of men rubbed the affected part with snow.

Age.—All patients with serious underlying disease were over 45. Omitting these eight, the average age of men with serious frost-bites was but one year above the average of the group.

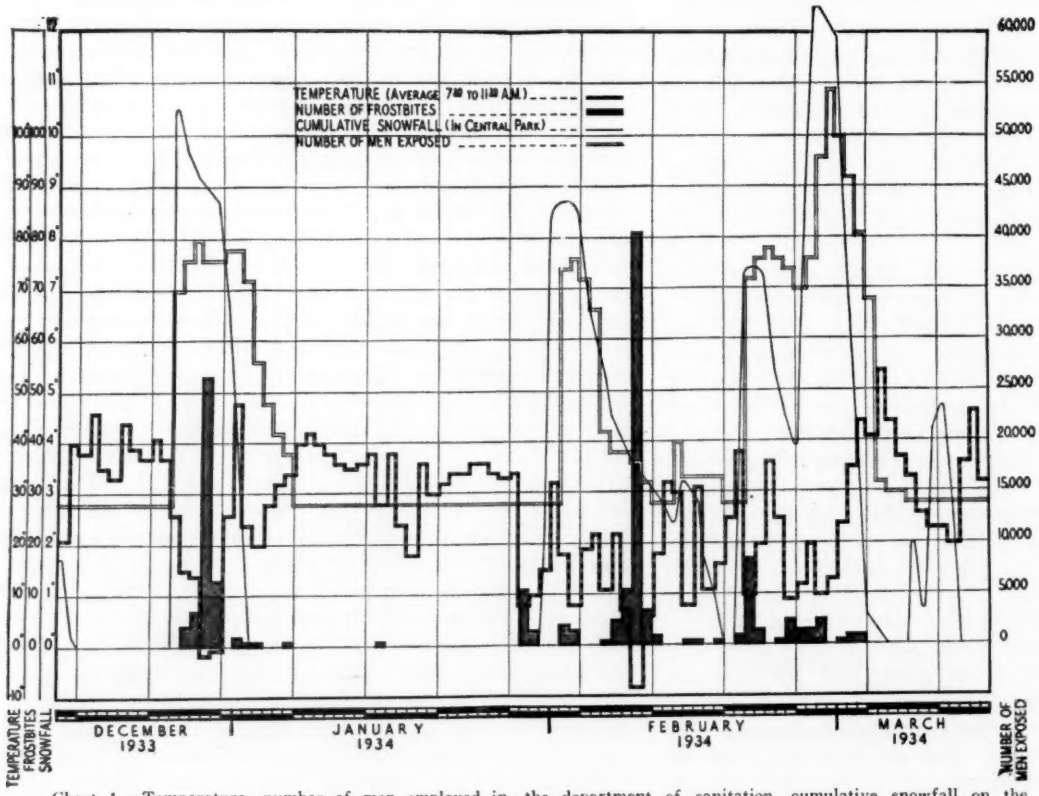

Chart 1.—Temperature, number of men employed in the department of sanitation, cumulative snowfall on the ground in Central Park and the number of frost-bites.

Clothing.—With few exceptions, none of the patients gave a history of feeling cold in the body. Temporary employees in some cases wore clothing that was too heavy for working with comfort. They felt warm after shoveling an hour and rested a while. It seems possible that the rest period, though the body was warm, permits freezing of the extremities. Wet hands and feet occurred but not with sufficient frequency to be considered an important factor. One patient, with serious malnutrition, stated that he wore thin, old gloves. Such a history was unusual, most workers stating that their gloves gave as much protection as could be expected. The men do not seem to realize the need of woolen mittens. A common custom among workers is noteworthy. Many of them wore two pairs of socks or two pairs of gloves. This must result in some constriction of the feet and fingers and predisposes to frost-bite. With few exceptions, patients stated that they wore good shoes, but some wore shoes with soles too thin for this type of work.

Alcoholism.—Direct questioning of individuals who had suffered from frost-bite would be unreliable on this subject and was done only when it seemed that the physician had their full confidence. From discussions with employees who did not sustain frost-bite, I had the impression that the consumption of alcohol during the working period and lunch time was very uncommon and not a factor in predisposing to frost-bite.

Coffee and Tobacco.—The drinking of hot coffee in the course of the work and immediately after the end of work was common. When an employee went into a lunch room solely to warm up, he usually ordered a cup of coffee. Most men smoked as soon as they could get indoors.

The skin temperature of the fingers, toes and ears is lower than that of the body. It has been demonstrated that caffeine [3] and tobacco [4] depress the temperature of the peripheral parts. Hot water, alcohol and acetylsalicylic acid, on the other hand, raise the peripheral temperature. Two cups of coffee (in a habitual coffee drinker) will lower the temperature of the fingers 2 degrees for several hours. A glass of hot water or 5 grains (0.3 Gm.) of acetylsalicylic acid will raise the peripheral temperature. The relation of tobacco and coffee to frost-bite deserves further investigation.

Nutrition.—Undernourishment to a degree to be manifest on physical examination was found in but two cases. Several temporary employees gave a history of daily food intake below normal in quality and quantity. Poor nutrition, even though not sufficient to show on physical examination, probably should be given some weight as a factor in producing frost-bite.

Previous Occupation.—Except so far as it affects nutrition, long periods of unemployment does not make the individual more susceptible, nor does previous indoor occupation.

Pathology.—A feeling of cold is a reaction of normal tissues. The sensation of cold is associated with increased circulation, evidenced by a healthy pink color. Numbness is the first symptom on prolonged exposure to cold and indicates that the sensory nerves are affected. All superficial sensation, pin prick, touch, heat and cold are diminished and later absent.

3. Bierman, William: Personal communication to the author.
4. Maddock, W. G., and Coller, F. A.: Peripheral Vasoconstriction by Tobacco Demonstrated by Skin Temperature Changes, Proc. Soc. Exper. Biol. & Med. **29**: 487-488 (Jan.) 1932.

This anesthesia is the dangerous element in frost-bite, because on continued exposure the damage may increase without any other symptoms, until all the soft tissues and bone have been injured. The distal parts, the terminal phalanges, the ears and the nose tip are the parts first affected. I have never seen a middle phalanx or proximal part affected unless the more distal portions were much more seriously involved.

At the onset of the frost-bite there is a constriction of the blood vessels evidenced by pallor of the skin. In the early stages this disappears quickly if the part is warmed. In the later stages the skin remains white; later it becomes purplish or black, and from twenty-four to forty-eight hours later blebs or chilblains form. Whether these pathologic effects are a direct result of the cold or due to vasoconstriction or a trophic nerve disturbance has been long debated. The fact that the most distal parts of the body, where the blood vessels are small, are the ones affected indicates that a change in the arterial supply is the important factor.

The changes in the skin are a useful but not always accurate measure of the damage to the deeper tissues. The motion of the joints may be restricted, but how much of this restriction is due to tendon injury and how much to injury of the joints it is impossible to state.

The bones are involved in severe cases. In the early stages, this condition is evidenced solely in roentgenograms by osteoporosis. Later, necrosis occurs with sinus formation. The discharge is slight, thin and gray. No pieces of bone are discharged and no sequestra are formed. There is no evidence of new bone formation. In late roentgenograms the joint spaces are narrowed or obliterated.

Histologic sections[5] of fingers of three patients amputated more than four months after the frost-bite showed edema and round cell infiltration of the skin and subcutaneous tissue. The skin was atrophic and ulcers showed no epithelial reparative process. Small pieces of bone tissue looked amorphous; there was no evidence of new bone formation. In places there was granulation tissue or dense connective tissue repair. The new tissues were less vascular than usual. Some of the sections showed blood vessels with organized thrombi. The interesting finding is the absence of epithelial or bone repair.

The clinical picture and what is known of the pathology point to an ischemia as the basis of the condition. From a therapeutic point of view, this must be considered the important factor. Even if some or all of the damage is due to the direct effect of freezing or to trophic changes, the only hope of restoration is the reestablishment of circulation as quickly as possible. It is axiomatic that whatever the cause of tissue injury, repair depends on early establishment of adequate blood supply.

Treatment.—The treatment was that commonly used in frost-bite; namely, ointments for unbroken skin conditions, sterile dressings for blebs or ulcers. If bone necrosis developed, the wound was cleansed and surgical dressings, wet or dry, were applied. Treatment was directed mainly to prevent infection and for that reason is important. Other than preventing complicating infections, it has no influence on the end result.

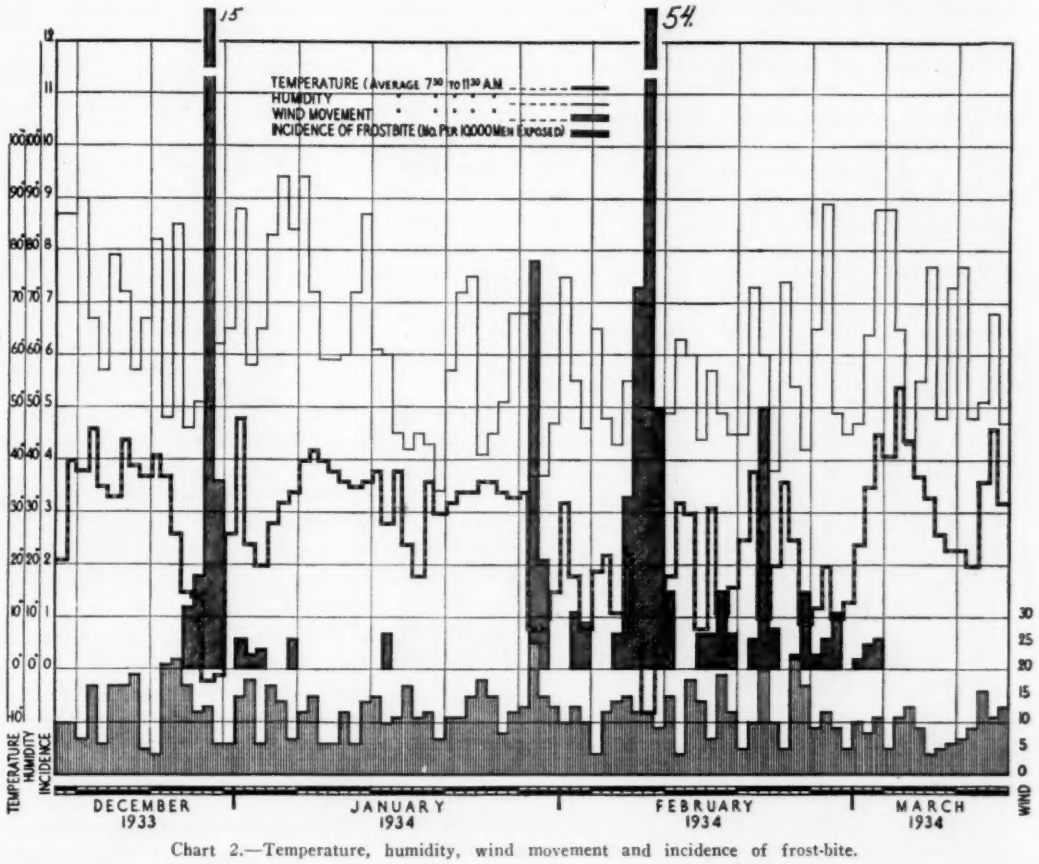

Chart 2.—Temperature, humidity, wind movement and incidence of frost-bite.

Secondary infections were treated with the usual surgical dressings. If the condition did not heal but bone necrosis continued for from three to five months, amputation was used as a last resort. This is sound conservative therapy and until recently was the only method of treatment available.

Whether the treatment was begun early or late apparently did not influence the end result. In a few cases, if treatment had been requested earlier, some days of disability might have been avoided by preventing infection of blisters, but none of these avoidable secondary infections developed to any serious condition.

Comment on Treatment: It is possible that exposure in colder climates results in a different condition from

5. The sections were obtained through the courtesy of Dr. J. M. Hitzrot. They were made by Dr. A. M. Sala, whose reports were freely used in this summary.

that seen in New York. Mummification or rapid gangrene is not seen; this no doubt requires other treatment. In our climate the custom of rubbing with snow must be condemned.[6] In the Alps, snow is soft, dry and clean; on city streets it is gritty, moist and dirty. The first treatment should consist of the application of gentle warmth, best obtained by wrapping the whole hand or foot in wool and thus using local body heat.

Considering the pathology of frost-bite, it seems to be a condition that can be favorably influenced by physical therapeutic methods. Good results have been reported by a number of physicians.[7] The recent reports of the use of apparatus for passive vascular exercise give the greatest promise.[8] There is nothing to be lost and everything to be gained by skilful and early use of physical therapy. Indiscriminate application and early use of heat lamps or diathermy, however, is to be condemned. This treatment must be administered by one skilled in physical modalities.

If necrosis of the phalanges takes place, surgical intervention is necessary. Nothing can be gained by procrastination. The wound seldom heals and, if it does, the skin becomes so adherent to the bone that amputation is necessary. If a partial amputation must be done, the character of the stump is more important than the loss of another centimeter in the length of the finger. The surgeon should bear in mind that a completely immobile finger is a more serious handicap to a manual worker than an amputation of that finger. Consideration must be given to the functional end result rather than to the anatomic loss.

Roentgenograms.—Roentgenography of the necrosing bone showed a picture different from septic osteomyelitis. Areas of sclerosis are unusual, indicating that new bone does not form readily.

Contracture of muscle tendons, both flexors and extensors, is the most common of permanent defects. In these cases, roentgenograms show a degree of osteoporosis far greater than in similar contractures due to infectious tenosynovitis, indicating that bone is always directly affected by frost-bite when there is tendon involvement.

Prevention.—When work can be postponed, due consideration should be given to hazards of temperatures below 8 F. or to temperatures between 8 and 14, when there is a very strong wind. Where the work permits, indoor rest periods of a half hour every two hours should be used. A worker who develops numbness and blanching of the extremities should discontinue work for the day. Attention should be given to clothing. It should be well fitting but not excessive. Gloves, socks and shoes are more important than body clothing to men who do hard labor. One good pair of well fitting gloves or preferably mittens will protect the hands better than a tight fitting double pair. Shoes that fit with one pair of socks may be too tight with two pairs. In preventing frost-bite, fit of gloves and foot wear is more important than thickness. Men with cardiovascular disease or diabetes should be excluded from outdoor work at low temperature.

Complications.—It is surprising that rhinitis, tonsillitis or pneumonia were not reported as complicating any of these frost-bites. No cases of aggravation of tuberculosis or other systemic diseases were found.

SUMMARY

Three hundred and eighty-eight cases of frost-bite occurred among employees of the Sanitation Department of the City of New York during the winter of 1933-1934. Analysis of the weather conditions during the days of exposure showed that temperatures below 14 F. constitute an industrial hazard to outdoor workers; high winds add to the risk; humidity is not a factor. Older men are not more susceptible except as they have cardiovascular disease or diabetes. General nutrition and clothing are of importance; more important than any other factor is the length of exposure after the first symptoms appear. Improved methods of treatment should be sought especially in the field of physical therapy.

Municipal Building.

6. Macklin, A. H.: The Treatment of Frost-Bite, Lancet **1**: 884-885 (April 25) 1925.

7. Macklin.[6] Courcoux, A.: Treatment of Frost-Bite by the Biokinetic Method of L. Jacquet, M. Press **99**: 438-439 (May 5) 1915.

8. Herman, L. G., and Reid, M. R.: The Pavaex (Passive Vascular Exercise) Treatment of Obliterative Arterial Diseases of the Extremities, J. Med., December 1933. Shipley, A. M., and Yeager, G. H.: Passive Vascular Exercise in the Treatment of Peripheral Circulatory Disease, Surg., Gynec. & Obst. **59**: 480-485 (Sept.) 1934.

CLINICAL MUTATIONS IN LYMPHOBLASTOMAS

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For years a group of diseases, now generally classed as lymphoblastomas, have been studied and interpreted as separate and distinct entities. This group comprises chiefly mycosis fungoides, Hodgkin's disease, lymphatic leukemia, lymphosarcoma and the subvarieties of these. Not only were these conditions considered quite separate one from another but there existed a wide difference of opinion regarding the interpretation of the clinical and pathologic changes in any one particular member of this group. To complicate an already chaotic state of affairs, cases appeared from time to time that possessed features of two or more of these diseases. Adding to this the widely varied and multiform lesions presented by any one condition made the confusion complete.

In recent years a semblance of order has emerged from the chaos with the growth of the view that these conditions are all genetically related neoplasms involving the lymphoid tissues. One of us[1] has repeatedly emphasized this view in various discussions of the lymphoblastomas and has pointed out that one variety may merge into another. There are those (Ewing,[2] Ormsby[3]) who believe that more is to be accomplished by separating these diseases into distinct entities. However, it seems that a clearer understanding may be had by recognizing the features that these conditions have in common and their possible relationships.[4] It is to

Studies and Contributions of the Department of Dermatology and Syphilology, University of Michigan Medical School, service of Dr. Udo J. Wile.

Read before the Section on Dermatology and Syphilology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Wile, U. J., in discussion on Fraser,[15] and on Ormsby and Finnerud[3] and Lane and Greenwood.[18]

2. Ewing, J., in discussion on Warthin.[11b]

3. Ormsby, O. S., and Finnerud, C. W.: Mycosis Fungoides, Arch. Dermat. & Syph. **27**: 631 (April) 1933.

4. Symmers, Douglas: The Relationship of the Toxic Lymphoid Hyperplasias to Lymphosarcoma and Allied Diseases, Arch. Int. Med. **21**: 237 (Feb.) 1918.

add further evidence to the view that the various members of the lymphoblastoma group are but different manifestations of an underlying lymphoblastomatous process that this paper is being presented.

The fact that granulomatous-appearing lesions occur in the skin during the course of these diseases has led to the view that the probable etiologic agent would be found to be infectious (Ormsby,[3] Macleod,[5] Ewing [2]).

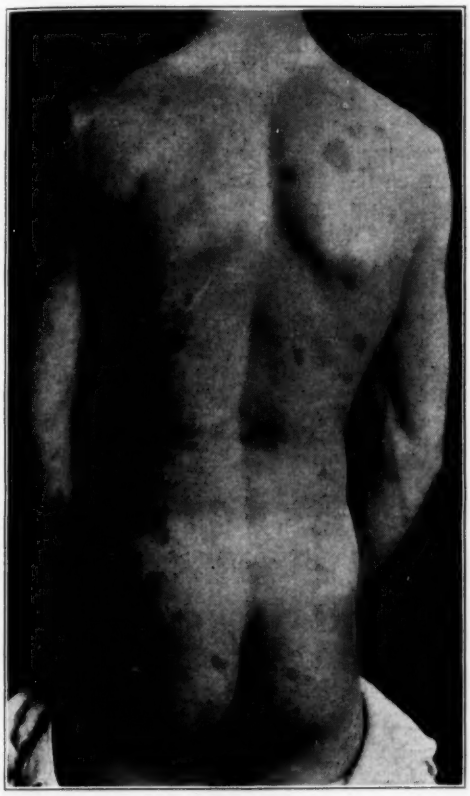

Fig. 1.—Patient when first seen in 1921, with infiltrated nodules and plaques characteristic of the prefungoid stage of mycosis fungoides.

Support for this view was found in the fact that the histologic picture seen in the lesions showed a connective tissue proliferation with an accompanying infiltrate of lymphoid cells, suggesting chronic infectious granuloma. A great amount of bacteriologic and immunologic investigation has been carried out in attempts to establish or rule out an infectious agent in Hodgkin's disease, leukemia and mycosis fungoides (Zinsser,[6] Fox,[7] Fraser [8]). Although Hodgkin's disease and leukemia are believed by some to be associated with tuberculosis, pneumonia and various acute infections (Reed,[9] Longcope,[10] Ewing [2]), no definite etiologic organism has been established.

On the other hand, Warthin,[11] in a study of a vast amount of biopsy and autopsy material, concludes that these diseases are all related neoplasms. They show metastasis and infiltration. They run a similar course with remissions and recurrences. He states further that fever occurs only when there is absorption of necrotic material, when there are no cures and no immune reactions and when there is a steady malignant progress to fatal termination.

The same histologic picture that is interpreted by some (Ormsby,[3] Macleod [5] and others) as inflammatory—namely, connective tissue proliferation and an infiltrate of lymphoid cells—has been considered by an increasing number of observers as a neoplastic process. Keim,[12] writing from this clinic, has pointed out that in all members of the group of clinical lymphoblastomas there is an infiltrate of abnormal cells of the lymphocyte series, differing in individual cases in the degree of maturity of these cells. The connective tissue proliferation is to be looked on as a stroma reaction to the presence of the tumor cells, such as is seen in other types of neoplasms. In the early, slow-growing stages, the connective tissue response is more marked, giving the appearance of inflammatory tissue, while in the later stages when the tumor cells are rapidly proliferating the stroma is seen to be not so well developed.

Fig. 2.—Same patient as in figure 1 twelve years later. The prefungoid lesions had disappeared, leaving only scaly and pigmented residua. One eroded nodule is seen on the posterior surface of the right thigh.

Fraser [13] and Keim [12] state that although the early lesions are inflammatory in their appearance, small groups of neoplastic cells may be found after careful search.

The view expressed by Keim from the clinical standpoint is also held by Warthin [11a] from the pathologic point of view; namely, that these diseases are all related and have in common a cell of the lymphocyte series as a type cell. The various types of lymphoblastoma differ

5. Macleod, J. M. H.: Diseases of the Skin, London, H. K. Lewis, 1920.
6. Zinsser, Hans, in discussion on Warthin [11b] and reply to Ewing.[2]
7. Fox, Herbert: American Association of Pathologists, Scientific Proceedings, Am. J. Path. **3**: 544 (Sept.) 1927.
8. Fraser, J. F.: The Pathology of Mycosis Fungoides, J. Cutan. Dis. **35**: 793 (Dec.) 1917.
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10. Longcope, W. T.: On the Pathologic Histology of Hodgkin's Disease, with Report of Series of Cases, Bull. Ayer Clin. Lab. Pennsylvania Hosp. **1**: 4, 1903.
11. (*a*) Warthin, A. S.: Genetic Neoplastic Relationships of Hodgkin's Disease, Aleukemic and Leukemic Lymphoblastoma, and Mycosis Fungoides, Ann. Surg. **93**: 153 (Jan.) 1931; (*b*) Scientific proceedings of the twenty-seventh Annual Meeting of American Association of Pathologists and Bacteriologists, Am. J. Path. **3**: 552 (Sept.) 1927.
12. Keim, H. L.: The Lymphoblastomas: Their Interrelationships, Arch. Dermat. & Syph. **19**: 533 (April) 1929.
13. Fraser, J. F.: The Interpretation of Mycosis Fungoides as a Variety of Lymphosarcoma, Arch. Dermat. & Syph. **11**: 425 (April) 1925.

chiefly in the degree of differentiation shown by these cells. Keim [12] points out that, in his series of cases, the pathologic changes in the various clinical types of lymphoblastoma are interchangeable. Montgomery,[14] in a study of the malignant erythrodermas, states that even though the histologic picture in early cases is typical of lymphoblastoma, it is impossible to prognosticate which type will eventually develop.

In a recent paper on mycosis fungoides, Ormsby [8] outlines certain differential points by which the members of this group may be separated. He states that mycosis fungoides involves chiefly the skin with a mixed cell infiltrate, spares the mucous membranes and only later involves the lymph glands, and that lymphosarcoma usually involves the lymph glands and mucous membranes primarily and presents a fairly uniform type of cellular infiltrate. Leukemia appears primarily in the blood stream, only later involving other structures, and Hodgkin's disease involves chiefly the lymph glands with a mixed type of cells and connective tissue proliferation, later involving the skin and other structures.

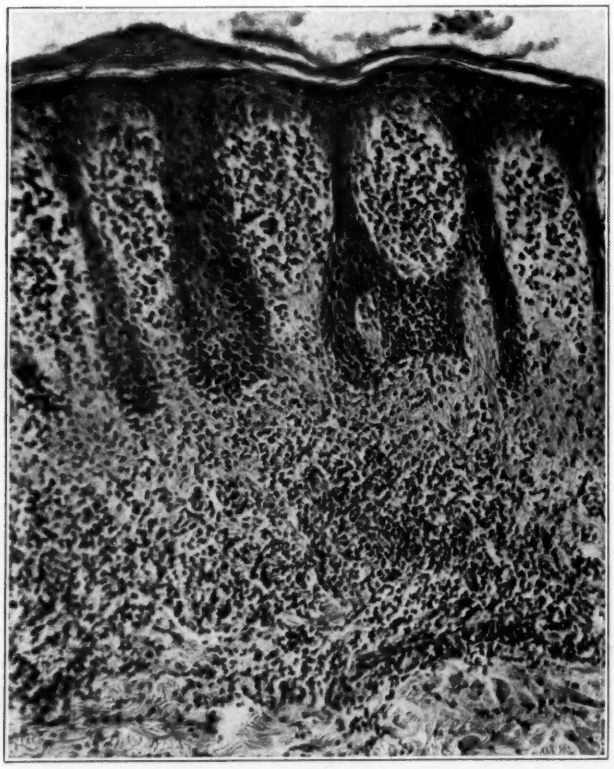

Fig. 3.—Section of the original lesion under low power, showing marked acanthosis and bandlike infiltrate of cells compatible with diagnosis of granuloma fungoides.

These differential points, while serving to classify clinical types or stages of lymphoblastomatous development, actually point to the underlying pathologic unity of these conditions, since they all originate in lymphoid or in reticulo-endothelial tissue. Montgomery,[14] Fraser [15] and others consider mycosis fungoides to be a neoplasm originating in the reticulo-endothelium of the skin. Lymphosarcoma presents a more highly differentiated type of cell originating in the lymph nodes. Mallory [16] states that Hodgkin's disease represents a scirrhous form of lymphoblastoma and that leukemia is a lymphosarcoma with tumor cells proliferating in the blood stream.

Recognizing that the various types of lymphoblastoma are but different manifestations of the same malignant process makes possible an understanding of those cases in which features of two or more of the lymphoblastoma group are present, or in which mutations from one type to another occur. Conversely, the presence of two or more of these types in one case, or the presence of mutation from one type to another in one individual, adds great emphasis to the view that they are simply different phases of the same process.

Cases that show transitions from one type to another are not rare in the literature. It has been pointed out that the proliferating tumor cells may eventually gain access to the blood stream and thus give an associated picture of lymphatic leukemia. Keim,[12] Symmers,[17] Fraser,[15] Lane,[18] Pardee and Zeit [19] have recorded such cases. Symmers [20] believes that Hodgkin's disease is separate from the other members of the group, but many cases of Hodgkin's disease are undistinguishable from mycosis fungoides. Fraser [8] has reported cases of mycosis fungoides terminating in typical Hodgkin's disease. Cases of lymphatic leukemia and of mycosis fungoides terminating in lymphosarcoma have been recorded (Fraser,[13] Keim [12]).

The following case shows the definite mutation that occurs between types of lymphoblastoma.

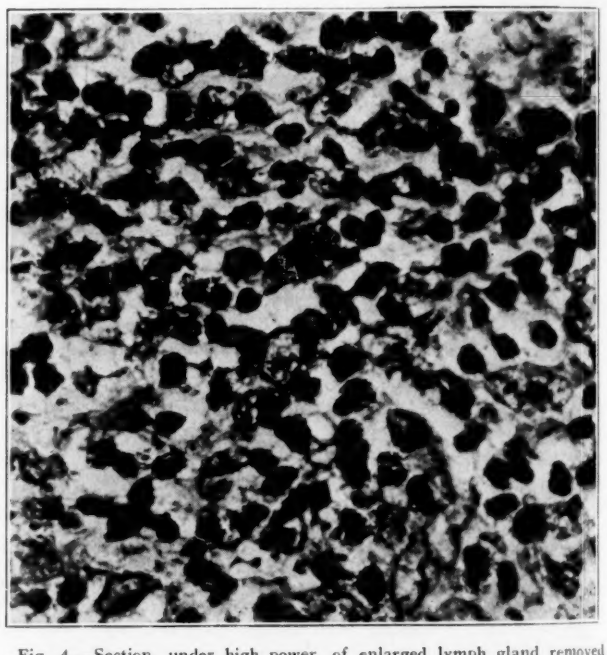

Fig. 4.—Section, under high power, of enlarged lymph gland removed in 1933, showing characteristic picture of Hodgkin's disease with numerous eosinophils and Dorothy Reed type of giant cells.

REPORT OF CASE

History.—F. S., an American merchant, aged 24, admitted in February 1921, complained chiefly of a pruritic eruption over the body. There was no history of a similar complaint in other

14. Montgomery, Hamilton: Exfoliative Dermatosis and Malignant Erythroderma, Arch. Dermat. & Syph. **27:** 253 (Feb.) 1933.
15. Fraser, J. F.: Mycosis Fungoides: Its Relation to Leukemia and Lymphosarcoma, Arch. Dermat. & Syph. **12:** 814-828 (Dec.) 1925.
16. Mallory, F. B.: Principles of Pathologic Histology, Philadelphia, W. B. Saunders Company, 1914, pp. 326-332.
17. Symmers, Douglas, J. Cutan. Dis. **37:** 1 (Jan.) 1919.
18. Lane, C. G., and Greenwood, A. M.: Lymphoblastoma (Mycosis Fungoides) and Hemorrhagic Sarcoma of Kaposi in the Same Person, Arch. Dermat. & Syph. **27:** 643 (April) 1933.
19. Pardee, L. C., and Zeit, F. R.: Mycosis Fungoides, J. Cutan. Dis. **29:** 7, 1911.
20. Symmers, Douglas: Mycosis Fungoides as a Clinical and Pathologic Nonexistent, Arch. Dermat. & Syph. **25:** 1 (Jan.) 1932; Am. J. M. Sc. **67:** 157 (Feb.), 313 (March) 1924.

members of the family; there was no history of cancer, tuberculosis or syphilis in the family.

The patient had been married for one year. His wife was well and had not been pregnant.

The patient had had all the common childhood diseases with good recovery. He had had occasional sore throats but no other illnesses. He stated that he had never had any venereal diseases.

Five years prior to admission a patch the size of a dime (18 mm.) appeared on the left flank. This gradually enlarged and spread to involve the entire trunk and extremities down to the elbows and knees. The pruritus had been most marked

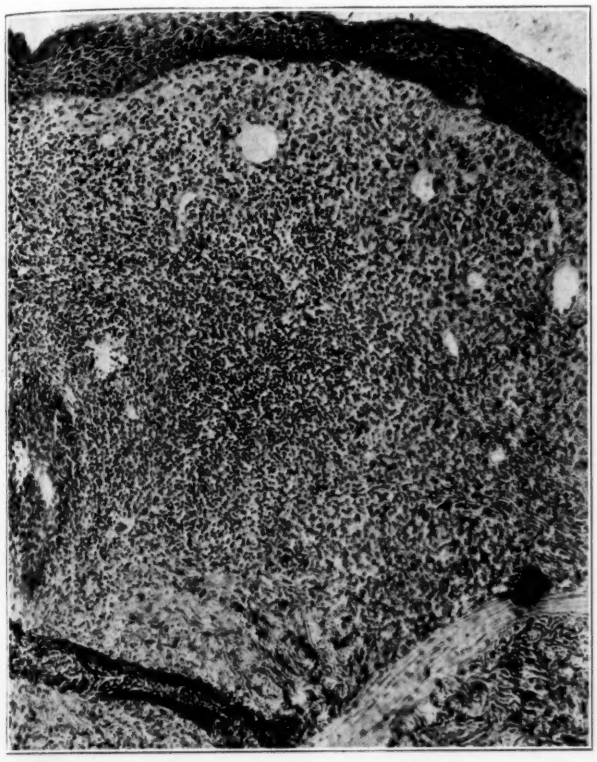

Fig. 5.—Section of skin nodule under low power. Biopsy taken in 1934, showing loss of rete pegs and dense cellular infiltrate limited to the upper corium.

in the last two years, during which time the eruption had become the most generalized. The condition had been treated locally in conjunction with mercury and arsenic by mouth.

Examination.—The patient was well developed and nourished. The scalp was clean. The pupils were round and equal. They reacted to light and in accommodation. The extra-ocular movements were normal. The skin of the upper arms, thighs and trunk presented a profuse eruption made up of many types of lesions. There were various sized light brown pigmented macules and flat papules, some of which were scaly and still others deeply infiltrated, forming small nodules and larger thick plaques. The color of all these lesions varied from a pale brown to a rather deep brownish purple. There were a number of scratched papules and linear excoriations. The outstanding characteristic was the polymorphous, nondescript, markedly pruritic nature of this condition with the tendency to formation of infiltrated nodules and plaques.

The mucous membranes showed no eruption. The lymph glands were palpable as split pea to pea sized nodules but were not enlarged or tender. The long bones were normal. The spleen and liver were not palpable. The heart and lungs were normal. The deep tendon reflexes were present, equal and normal.

The diagnosis was the prefungoid stage of mycosis fungoides. Biopsy of the skin at this time showed well advanced lymphoblastoma cutis.

Course.—During the next few weeks the patient received mild irradiation to the entire body and particularly to the thickened areas, with the resulting diminution of thickness of the lesions and a decrease in pruritus.

One year later the patient returned with a recent recurrence of the pruritus but otherwise much the same as before.

A year and a half ago (1933), the glands became enlarged, particularly in the left axilla. He was examined in a Toledo hospital and was given roentgen therapy.

Biopsy of the skin at this time showed "lymphoblastoma cutis with no heavier infiltration than in 1921 but with marked atrophy of the skin."

Biopsy of a lymph node showed "advanced Hodgkin's disease of the lymphoblastoma type. Numerous Dorothy Reed cells and many eosinophils."

Reexamination in 1933.—The patient, now 37, was well developed and nourished and was not acutely ill. He presented a generalized eruption consisting of scaly papules and plaques that varied in size from pea sized to double palm size. These were slightly elevated and brick red, fading off to a brownish color. The eruption was most marked around the flanks, in the groins, popliteal spaces and axillae, and on the upper part of the chest, upper part of the back and the face. There were a few lesions in the posterior hair line of the scalp. Other areas of the body were involved but much more sparsely, with much normal skin between the lesions. The lesions themselves were a brick red, slightly elevated and covered with fine scales. The skin over these lesions was thin and wrinkled. Numerous small pea sized nodules that were slightly more elevated than the remainder of the skin and somewhat infiltrated on palpation occurred in the larger plaques, chiefly on the inner surface of the right thigh and on the medial surfaces of the forearms. These were slightly more erythematous than the surrounding tissue and were rather firm to palpation. One of these lesions on the posterior surface of the left thigh was eroded and covered with a serohemorrhagic crust. The palms and soles

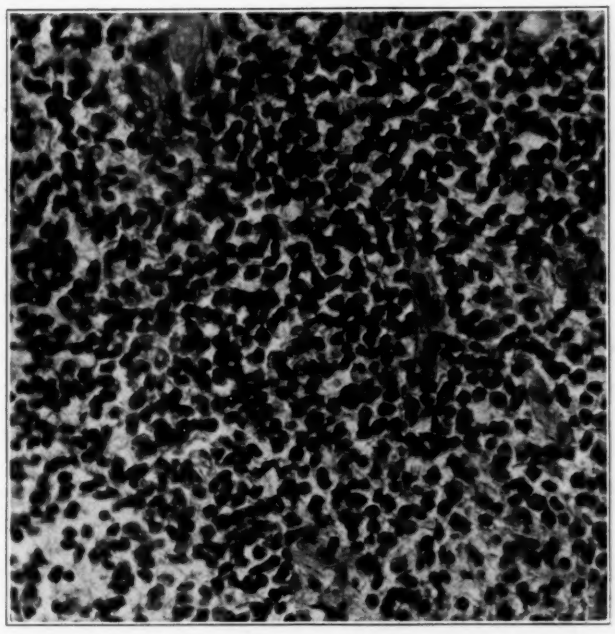

Fig. 6.—Section of the same nodule under medium high power, showing characteristic changes of Hodgkin's disease with numerous eosinophils and the Dorothy Reed type of giant cells.

were not involved and most of the scalp was free. There were no lesions on the mucous membrane.

The lymph glands showed generalized enlargement varying from the size of a pea to that of a hickory nut, the largest glands being found in the left axilla forming a clump of glands approximately half the size of a fist, each gland being somewhat rubbery in consistency but more or less discrete. The glands in the inguinal region were about bean size.

The liver was slightly tender and the edge could be felt about one fingerbreadth below the right costal margin. The edge was soft. The spleen was not felt.

The bones and joints and tendon reflexes were normal.

Roentgen studies revealed:

1. Abnormal opacity of the second lumbar vertebra. We believe that lymphoblastomatous involvement is the most likely explanation.

2. No demonstrable abnormality in the long bones.

3. Old calcified tuberculous lesions in both apexes and right base—the chest otherwise was normal.

4. A barium sulphate enema revealed a normal colon.

Results of the examination of the blood are given in the accompanying table.

Examination of the Blood

	Blood Studies			Differential						
Date	Red Blood Cells	Hemoglobin, per Cent	White Blood Cells	Polymorphonuclears, per Cent	Polymorphonuclear Eosinophils	Polymorphonuclear Basophils	Small Lymphocytes	Large Lymphocytes	Monocytes	Lymphoblasts
11/28/33	4,300,000	79	11,000	79.5	7.0	0.5	2.5	5.0	5.5	...
12/27/33	4,000,000	77	8,500	76.0	3.5	...	9.0	2.0	9.5	...
2/ 6/34	3,970,000	72	4,000	61.5	6.0	...	5.5	13.0	13.5	0.5

Since the last examination the patient has received superficial roentgen irradiation to the skin and high voltage therapy to the entire glandular system, with subsequent relief of the pruritus and a diminution of the size of the lymph glands. Within the last few months the patient has returned with several new nodules. Biopsy of one of these revealed a similar picture to that presented by the previous biopsies, with the exception that there were numerous eosinophils and giant cells with hyperchromatic nuclei.

COMMENT

This case when first examined in 1921 presented the typical picture of the prefungoid stage of mycosis fungoides. The skin was chiefly involved, the mucous membranes, lymph glands and viscera being spared clinically. The skin presented pruritic, pigmented and dully erythematous plaques and nodules, which showed fine superficial scaling. The microscopic examination of the skin showed a mild acanthosis and parakeratosis in the epidermis. In the corium there was a papillary and subpapillary infiltration of lymphoid cells of a mixed type resting on a connective tissue reticulum. In all respects this case conformed to the picture of early mycosis fungoides.

Recently the lymph glands became enlarged and tender. There also appeared low back pain, which at first was interpreted as lumbosacral strain. Roentgen studies of the lumbar spine showed an increase in density in the second lumbar vertebra suggestive of a metastatic malignant growth. Microscopic examination of the lymph glands at this time revealed a rather marked fibrosis, numerous eosinophils and Dorothy Reed type of giant cells characteristic of Hodgkin's disease. The most recent biopsy of the skin showed numerous eosinophils and giant cells in addition to the mixed cell infiltrate previously described.

The case originally presented the features emphasized by Ormsby in the differentiation of mycosis fungoides from the other lymphoblastomas, while at a later date it gave the characteristic changes of Hodgkin's disease. If one is to believe that the two conditions are distinct entities, there are but two ways to explain this case: first, that it is a case of mycosis fungoides in a patient who has later developed Hodgkin's disease also, and, second, that the disease was originally a case of Hodgkin's disease which was at first misinterpreted as mycosis fungoides and only later recognized.

The first explanation seems a poor one, since it requires two diagnoses to explain a condition that has been continuous. In the light of the material pointed out in the early part of this paper, it must be observed also that the underlying pathologic processes have retained their essential features throughout; namely, the fibroblastic proliferation and infiltration of lymphoid cells. The microscopic picture in the skin itself did not vary in essential details.

The second explanation also seems inadequate, since this case in the early part of its course possesses all the characteristics that identify the premycotic stage of mycosis fungoides as an entity.

A more logical explanation, and one that is easier to understand, is that this case presents a malignant disease of the lymphoid tissues, first involving the lymphoid structures in the skin and producing the picture that is recognized as mycosis fungoides, and later involving the lymph glands themselves, producing the picture that dermatologists have learned to classify as Hodgkin's disease.

As pointed out previously, in the slow growing types of lymphoblastoma there are apt to be more fibroblastic proliferations. Fibrosis in the lymph glands in Hodgkin's disease is one of the important diagnostic changes, and this is well marked in this particular case. It is interesting to note that this case has shown unusually slow progress, the known duration extending over a period of eighteen years. It is not improbable that the irradiation received by the patient has been influential in preventing the late picture of mycosis fungoides and may have been influential in the production of fibrosis, which constitutes an important part of the pathologic picture in Hodgkin's disease.

SUMMARY AND CONCLUSIONS

1. A case of unusual duration showed definitely a mutation from clinical mycosis fungoides to Hodgkin's disease.

2. Clinical mutations that occur between the various types of lymphoblastomas constitute strong evidence in favor of the view that lymphoblastomas are genetically related neoplasms involving the lymphoid tissues.

3. It is possible that irradiation may have influenced the course of the disease.

201 South Main Street.

ADDENDUM.—Since the writing of this paper, the patient developed an enormous increase in size of all his superficial lymph glands and died with a typical clinical picture of Hodgkin's disease.

ABSTRACT OF DISCUSSION

DR. HARTHER L. KEIM, Detroit: With the presentation of this case, the authors have forged a link in the ever increasing lengthy chain tending to support the interrelationships between these various lymphoblastomas. The clinical evidence here presented with reference to the mutation of a case of granuloma fungoides into Hodgkin's disease seems to me almost incontestable. The evaluation and interpretation of the diseases of the hematopoietic system have been one of the major medical problems in recent years. Dermatologists are especially interested in the cutaneous aspects of four of these lymphoblastomas; namely, leukemia, granuloma fungoides, Hodgkin's disease and lymphosarcoma. Ten years ago, in presenting a case of leukemia cutis before this section, I made reference to the genetic relationships that existed between this group of clinically divergent dermatoses. It was suggested then that much could be gained by a proper classification of this group of widely

divergent clinical manifestations. Five years later, twenty cases of lymphoblastoma with ten autopsy reports were recorded and their interrelations discussed. In this group the striking similarity of the cutaneous microscopic picture was stressed and two consistent features were emphasized, namely, the background of the connective tissue stroma varying in density, and the cellular infiltrate first occurring in the so-called cutaneous lymph nodes, and later the infiltrate increasing, being of the lymphocytic series, to produce the characteristic, fully developed, bandlike infiltration as seen in all these lymphoblastomas in their later stages. Discussion still exists as to the nature of these lymphoblastomas. It has always seemed to me that they are not infectious but rather neoplastic in nature. In support of that hypothesis, four facts are of interest: (1) This group of diseases is invariably fatal; (2) they spread by infiltration; (3) they are essentially destructive; (4) they have no protective function. In short, they have the characteristics of neoplastic disease and none of the characteristics of infections. It is simpler and more natural to correlate these diseases than to strain at the unpractical and artificial task of attempting to separate them into clinical and anatomic entities.

Dr. George M. MacKee, New York: The authors have added to existing knowledge a definite instance of mutation in that a case of mycosis fungoides showed Hodgkin's disease of the lymphatic glands. Both the clinical and histologic features of lymphoblastomas are often confusing. Occasionally these features are sufficiently definite for designation of one particular member of the group, but not infrequently it is necessary to hedge and make a diagnosis of lymphoblastoma. Occasionally, one encounters an eruption that both clinically and histologically is definitely identified as an inflammation — psoriasis, eczema, parapsoriasis, and the like. Later it is proved to be mycosis fungoides. In such instances, was the case one of psoriasis that changed to mycosis fungoides or was it one of the prefungoid stage of mycosis fungoides indistinguishable from psoriasis? I favor the latter possibility. This delves into the question of the actual identity of dermatologic entities, which is none too secure.

Dr. Marion B. Sulzberger, New York: It might be worth while to call attention to a recent article from the Fischer-Wasels school, which was mentioned in an editorial in The Journal. The authors found, as a by-product of some experiments with indole poisoning in mice, that they could create in the mice different types of disease of the lymphatic system. I looked up the original publication. The protocols were not detailed, but the essential features seemed to be that a certain large dose of indole led to lymphadenoses and inflammatory changes in the lymphatic system, and when the dose was decreased and given more continuously, that is, when smaller doses were persisted with, these lymphadenoses began to change into conditions that looked like malignancy. Eventually it became possible to produce true lymphosarcomas, which metastasized. I believe such observations may be of great importance and that they may bear some relation to the transition between inflammatory and neoplastic changes such as we frequently see in dermatology, and as brought out by Dr. Keim and the authors.

Dr. William H. Guy, Pittsburgh: There is essential agreement that this is a group of malignant diseases that are genetically related and that the point to be raised is whether or not there is actual development of a separate disease ensuing on a primary disease of a different nature, or whether it is a mutation from one form of the disease into another; in other words, whether or not these diseases are related not only genetically by virtue of their origin in the reticulo-endothelial system, or whether they are diseases of that system but of separate and distinct etiology. An alternate explanation that has to be considered in mutation is the possibility, as implied in Dr. MacKee's discussion, that long continued insult applied to the skin may be the determining factor that develops an entirely different clinical condition.

Dr. Fred D. Weidman, Philadelphia: I don't think there can be any question about the clinical mutations that are comprised in the lymphogranulomas; a number of them are valid entities. When one gets into the pathologic realm, the one of tissue changes, however, I think that one can better understand the situation if one first thinks of the changes that take place in fibrous tissue, which is only another chronic reactive tissue of the body, just as reticulo-endothelial tissue is. Think of the different sequences in the forms of fibrous tissue that may be seen in a nonspecific, say chronic inflammatory, disease. A fresh scar looks different from an old scar. Some scars are pigmented; some are not. Some are depressed. Some are soft and pliable. Yet all are comprised by the same kind of tissue. Histologically, there will be variations, too; fibroblasts of young scars differ considerably, but within limits, from old, hyaline collagen bundles. Turning next to the reticulo-endothelial system, I believe that there is a similar plasticity in the type of change that may take place. Reticulo-endothelial means two kinds of cells concerned—those of the lymphocyte series and those of the reticular series, meaning that the situation is more involved than for fibrous tissue. The changes that take place in hyperplasias of the reticulo-endothelial system have not been worked out fully as have those in the changes that take place in the fibrous tissue. In that light it can be understood how at one stage or another of a certain pathologic condition there would be purely a reticulosis. I am about to report a case of aleukemic reticulosis which Dr. Wayson sent me from Honolulu, with massive infiltrations around the face which were at first regarded as leprosy. At necropsy the bone marrow was found severely involved by a pure reticulosis. I have recently studied some cases of Torula infection in which there were Hodgkin's-like changes, and Dr. Wile recently reported in New York a similar case. In torulosis and yet other cases like the indole intoxication that Dr. Sulzberger spoke of, there may be a definite etiologic starting point from which to begin in trying to test out whether different gradations in reaction of the reticulo-endothelial reaction may take place. This parallelism with fibrous tissue reactions is something that I think ought to be kept more closely in mind as one studies these lymphogranulomas. I believe that the concept of the lymphogranulomas is well founded as a group; that for the time being it is proper to recognize clinically the differences between granuloma fungoides and Hodgkin's disease. They are convenient designations to employ in medical conversations, but when more is known about the details of the histologic or biologic changes of the reticulo-endothelial apparatus, it will be found that they are not etiologic entities.

Dr. Frank Stiles Jr., Ann Arbor, Mich.: Cases of psoriasis have been reported, cases of parapsoriasis and other relatively benign dermatoses, which have changed into lymphoblastoma. In fact, at the present time one or two cases have been observed in the University Clinic which are just on the fence, so to speak; they appear to be making this particular transition at this time. As to Dr. Sulzberger's point, I have no experience with that particular portion of the question, and so I have nothing to add to his remarks. Dr. Keim covered most of the material which I planned to use in the closing talk, and I just want to point out further that these mutations seem to be the important connecting link that ties this group together. They are clinically individual diseases which change from one to another and which have a common denominator in an infiltrate composed of abnormal lymphocytes, and when one type is seen going into another it lays great emphasis on the fact that they are probably very closely genetically related.

Activation of Foods by Irradiation.—Sunshine, like fish oil, is an old remedy for rickets. Its importance, however, was not fully appreciated until Huldschinsky (1919, 1920), by means of radiographs, clearly demonstrated the healing action of sunlight and of the light from the quartz mercury arc. Hess, Pappenheimer and Weinstock (1922) determined that the effective wavelengths of light are the shorter ultraviolet waves of the solar spectrum, or the still shorter waves of artificial sources. Goldblatt and Soames (1923) discovered that the livers of irradiated rats, when fed to nonirradiated rats, convey some of the virtue of irradiation to the animals which eat them. This, in greatest brevity, is the background for the discovery of the activation of foods and sterols by irradiation.—Bills, C. E.: Physiology of the Sterols, Including Vitamin D, *Physiol. Rev.* **15**:1 (Jan.) 1935.

SIDEROFIBROSIS OF THE SPLEEN IN SICKLE CELL ANEMIA

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The pathologic condition of the spleen in sickle cell anemia is characterized by a series of progressive changes from congestive enlargement to fibrotic atrophy. The gross and microscopic appearances of spleens examined at different intervals in this process are varied and apparently dissimilar. The descriptions of the thirty-three spleens available in the literature [1] are mostly in the form of single case reports by different authors, and with few exceptions they are brief and lacking in essential details. It is difficult to obtain from these descriptions a clear concept of the sequence of events or a picture of the process as a whole. It is my purpose in this paper to describe the lesions of the spleen in sickle cell anemia, to trace the development of the process and to correlate the changes found with the clinical picture and with similar manifestations in other diseases.

Fig. 1.—Early enlarged spleen in sickle cell anemia. Congested pulp and hemorrhage into trabeculae. Reduced one fifth from a photomicrograph with a magnification of 40 diameters.

The material on which the work is based consists of an analysis of the literature dealing specifically with the pathology of the spleen in sickle cell anemia and a study of nineteen spleens from patients with active sickle cell anemia. Four of these spleens were removed at autopsy at the Memphis General Hospital. The rest were obtained from other workers, who, on request for material from their reported cases, kindly furnished blocks or sections. I am indebted to Drs. Steinberg, Bothe, Waltz, E. C. Smith, Lash, Cooley, Bennett, Mathews and Corrigan for aid in the assembling of sufficient material to make possible the study of a consecutive series. Assistance in the interpretation of the microscopic examinations was given by Dr. R. E. Ching, instructor in pathology, and the photomicrographs were made by Mr. J. G. J. Perkins Jr., photographer, at the University of Tennessee Pathological Institute.

The earliest demonstrable lesion in the spleen in sickle cell anemia is congestion of the reticular spaces with sickled erythrocytes, and dilatation of the capillaries in the malpighian corpuscles. The spleen representative of this stage is enlarged, dark purple and soft. The surface is smooth, the capsule and trabeculae are thin and inconspicuous, and the splenic corpuscles are indistinct.

On microscopic examination the splenic cords are stuffed with entangled masses of greatly elongated, pointed, curved and bizarre shaped erythrocytes, which render the nuclear structures and reticulum relatively inconspicuous. The sinusoids are for the most part compressed and empty. Brown and black pigment granules, giving a variable reaction for iron, are present in small quantities, free and within the cytoplasm of the pulp phagocytes and the endothelial cells of the sinusoids. The splenic corpuscles are small, their germinal centers absent or atrophic. There is intense congestion of the pulp at the margins of the corpuscles. In some cases, but not in all, the capillaries of the malpighian bodies are dilated, so that they appear as multiple small varices or as one or more great pools of blood lying within or at the edge of the lymphoid aggregates.[2]

In the areas of intense congestion in the region of the terminal arterioles, hemorrhages occur. Sickled erythrocytes are found in the reticular spaces of the splenic corpuscles, around the central arterioles and in the peripheral trabeculae (fig. 1). As the perivascular hemorrhages organize, the vessel walls become greatly thickened and there are pigmentary changes and depositions of mineral salts. The lumens of the vessels become narrowed, owing to intimal hyperplasia and to subintimal hyalinization. In these narrowed terminal vessels in which there is stasis, and around which there is an inflammatory reaction, thrombi readily form.

Infarcts are common. They are usually multiple and small, spherical or wedge shaped, dull gray and surrounded by congested pulp. Thrombi in the larger arterial branches are rare, but massive infarctions do occur. On organization the areas of infarction are replaced by fibrous tissue, usually without calcification or extensive pigmentary changes.

The picture presented by the spleen during the stage of organization of hemorrhages is complicated, varied and colorful. The lesions do not all progress at the same rate. Congestion, hemorrhages, infarcts and organization may occur simultaneously. The spleen representative of the early stages of fibrosis is still enlarged but becomes progressively smaller. The surface is nodular, owing to depressed scars and elevations of the still congested areas. The organ is firm, and on sectioning the knife meets with resistance. The capsule is irregularly thickened and the trabeculae are prominent. The dark purple characteristic of the highly congested stage is now replaced by a lighter, more slate-

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Read before the Section on Pathology and Physiology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14, 1934.

1. Diggs, L. W., and Ching, R. E.: (for bibliography relating to pathology of sickle cell anemia, complete to 1932), South. M. J., **27:** 839 (Oct.) 1934. Hargrove, M. D., and Mathews, W. R.: J. Lab. & Clin. Med. **19:** 126 (Nov.) 1933. Lash, A. F.: Am. J. Obst. & Gynec. **27:** 79 (Jan.) 1934. McClellan, R. H., and Entwisle, R. M.: J. Lab. & Clin. Med. **19:** 507 (Feb.) 1934. Corrigan, J. C., and Schiller, I. W.: New England J. Med. **210:** 410 (Feb. 22) 1934.

2. Jaffé, R. H.: Virchows Arch. f. path. Anat. **265:** 452, 1927. Rich, A. R.: Bull. Johns Hopkins Hosp. **43:** 398 (Dec.) 1928.

like color with tints of brown and localized areas of gray. Scattered throughout are numerous yellowish brown nodules, varying in size from barely visible flecks to masses from 1 to 2 mm. in diameter. These nodules are hard, irregular in outline and firmly attached to the surrounding tissues, and give the appearance of embedded granules of rust.

Microscopic examination of these yellow-brown nodules reveals localized units of connective tissue containing conspicuous hematoxylin staining masses and brilliant pigmentary deposits. These colorful units are usually in contact on one side with the trabeculae, with which they are continuous and from which they project out into the congested pulp (fig. 2). In the early stages, nodules completely surrounded by pulp are occasionally seen. The shape of the nodules is extremely variable, and the irregular margins are poorly defined and merge in a nebulous manner with the zone of erythrocytes (fig. 3).

Fig. 2.—Beginning siderofibrotic nodules in the spleen in sickle cell anemia. Organization of hemorrhage in trabeculae and at sites of splenic corpuscles, with pigmentary changes and iron and calcium incrustations. Reduced one fifth from a photomicrograph with a magnification of 40 diameters.

The sequence of tissue changes taking place in the development of the full blown nodule is as follows: First there is proliferation of fibroblasts in the hemorrhagic area around the central arteriole. Leukocytes wander in and there are large quantities of yellow-brown granules. The pigment granules are phagocytized by the elongated fixed tissue cells and by the large mononuclears. The connective tissue cells and pigment laden phagocytes undergo degenerative changes. Delicate wavy and branching filaments taking a solid or granular hematoxylin stain and having the pattern of reticulum appear in and about the extravasated sickled erythrocytes. These filaments become thicker, often are segmented, and in places form tangled masses. They lie as brushlike structures in the organizing hemorrhagic zone or encircle the vessels as a dense network (fig. 2). These blue staining structures give the chemical reactions for calcium and iron and will be referred to as calcium and iron incrustations or depositions of mineral salts. Green filaments, likewise with branching and segmented arrangements, appear and mingle with the blue staining fibers or are continuous with them. As the process advances, the connective tissue becomes more dense and there is hyalinization. The erythrocytes disappear. Highly refractile masses of brown pigment with varying tints of yellow and green lie in the tissue spaces. These brown structures are often segmented and resemble bamboo sticks (fig. 4). They may appear as irregular crystals or as cylinders having spherical knobs at their tips. They are often infiltrated with iron and calcium salts and consequently present varying combinations of color in the stained sections. Large roundish masses, ranging in color from greenish blue to black, having lamellated, fissured or double contoured structures, are conspicuous (fig. 4). Foreign body giant cells are numerous and may lie in proximity to or encircle any of these constituents.

The organization of the periarterial hemorrhages in the trabeculae is accompanied by tissue changes similar to those found in the splenic corpuscles, except that the pattern of the iron and calcium incrustations follows that of the elastic fibers of the trabeculae. One sees slightly wavy or straight spindles, parallel to one another and to the longitudinal axes of the blood vessels. These vary in number from a few strands to solid calcified bundles. At the point where the trabeculae join the siderotic nodules, the filaments appear as radiating splinters or surround the vessels in a distorted arrangement (fig. 2). In the later stages the calcified structures bulge out into the narrowed lumens of the vessels or may completely block them.

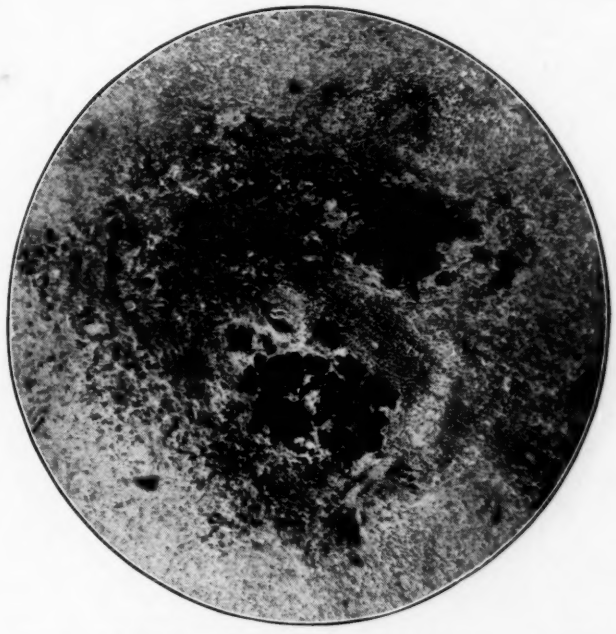

Fig. 3.—Siderofibrotic nodule. Reduced one fifth from a photomicrograph with a magnification of 450 diameters.

As the organization of the hemorrhages proceeds, at the sites of the malpighian bodies and in the trabeculae there is an increase in the pulp reticulum and a relative decrease in erythrocytes. Ultimately the pulp becomes completely replaced by fibrous tissue, and the pulp, the remains of the splenic corpuscles and the trabeculae become coalesced into a hyalinized connective tissue mass in which the pigment and calcium and iron incrustations are entrapped (fig. 5).

The appearance of the spleen in the later stages of the siderotic nodule is that of a small hard, nodular organ of a dull gray. On section one sees wide whitish fibrous tissue strands, flecked with yellow and brown. The residual pulp is partitioned off into localized units and varies in color, depending on the degree of congestion, fibrosis and pigmentation.

Microscopically the picture is subject to wide variations in different spleens and in different portions of the same spleen. All small firm spleens in sickle cell anemia have in common a great increase in connective tissue, a relative decrease in pulp, an absence of typical splenic corpuscles, depositions of pigment, iron and calcium incrustations, obliterative vascular changes and periarterial fibrosis. The pulp, instead of being a mass of erythrocytes as in the early stages, is now a mass of reticulum between which the packed sickled cells lie in capillary-like spaces. In some spleens the sinusoids are greatly dilated and tortuous and their endothelial cells are hypertrophied. Pigment granules are conspicuous in the organizing lobules, and there is phagocytosis of erythrocytes by macrophages. Giant cells and branching filaments are occasionally seen. Eosinophils, plasma cells and infiltrations of lymphocytes are found. The reticulum of the pulp is continuous with that of the trabeculae, and boundaries are indistinct. The whole picture is one of confusion and distortion of the anatomic pattern (fig. 5).

In the last stages the spleen is reduced to a small wrinkled mass, often buried in adhesions. The capsule is greatly thickened and hyalinized. There is no pulp, and pigment is inconspicuous. Thick walled calcified blood vessels with narrowed lumens lie in a mass of disarranged degenerated connective tissue (fig. 6).

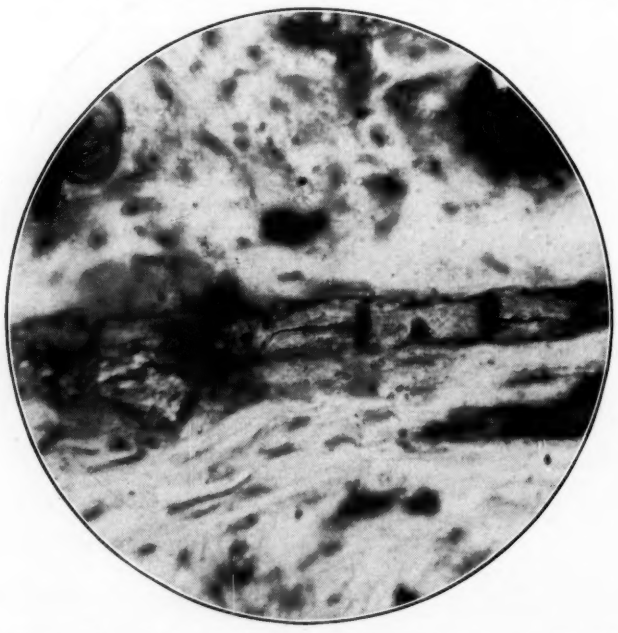

Fig. 4.—Segmented and branching greenish-brown structures and lamellated calcified masses in degenerative connective tissue in siderofibrotic nodule. Reduced from a photomicrograph with a magnification of 800 diameters.

There are few nuclei of any kind and little blood. Finally the last recognizable remnants of the spleen disappear and there is nothing left but narrowed splenic vessels terminating in scar tissue.

Many of the tissue changes just described, such as congestion of the pulp, hemorrhages, infarcts, vascular changes, siderotic nodules, fibrosis and atrophy, occur in other diseases. The peculiar deformity of the erythrocytes is the one feature that is specific for sickle cell anemia in all stages of the process and is not found in other conditions. It is the combination of sickle cells with the other lesions that makes the spleen in sickle cell anemia unique.

Fig. 5.—Later siderofibrotic changes in the spleen in sickle cell anemia. Distortion of anatomic pattern, fibrous tissue replacement of the pulp, mineral salt deposits. Reduced from a photomicrograph with a magnification of 40 diameters.

The siderofibrotic lesions in sickle cell anemia are similar to the siderotic nodules or "Gandy-Gamna bodies" described in hemolytic jaundice, splenic anemia, splenomegaly associated with portal stasis and numerous other conditions. Bennett [3] and Jaffé and Hill [4] were the first to note the similarity of the splenic changes found in sickle cell anemia to those observed in other conditions.

One group of investigators has interpreted the branching and segmented filaments and refractile masses in the siderotic nodule as mycelial structures and has presented evidence supporting the concept of fungi as the etiologic agent in the production of the nodule and of certain forms of splenomegaly. The majority of workers discredit the mycotic theory and hold that the siderotic nodule is the result of the organization of hemorrhages in congested spleens and that the structures morphologically resembling fungi are pigment deposits and iron and calcium incrustations in degenerative connective tissue. The reader is referred to articles by Sprunt,[5] Gamna,[6] McNee,[7] Abrikossoff,[8] Gibson,[9] McMichael,[10] Reimann and

3. Bennett, G. A.: Splenic Atrophy with Calcium and Iron Incrustations (Nodular Splenic Atrophy), Arch. Path. **7**: 71 (Jan.) 1929; Sickle Cell Anemia, ibid. **7**: 801 (May) 1929.

4. Jaffé, R. H., and Hill, L. R.: Splenic Mycosis, Arch. Path. **6**: 196 (Aug.) 1928.

5. Sprunt, T. P.: J. Exper. Med. **14**: 59, 1911.

6. Gamna, C.: Presse méd. **36**: 357 (March 21) 1928.

7. McNee, J. W.: Glasgow M. J. **111**: 65 (Feb.), 193 (April), 288 (May) 1929.

8. Abrikossoff, A.: Virchows Arch. f. path. Anat. **272**: 593, 1929.

9. Gibson, A. G.: The Mycoses of the Spleen, New York, Macmillan Company, 1930.

10. McMichael, J.: Edinburgh M. J. **38**: 1 (Jan.) 1931.

Kurotchkin,[11] and Fasiani and Oselladore[12] for a summary of the voluminous and controversial literature dealing with the siderotic nodule, mycotic splenomegaly, splenic mycosis and the like. This series of spleens from sickle cell anemia patients afforded an excellent opportunity to observe the various stages of development of the siderotic nodule from its inception to its disappearance. Many structures were found bearing superficial resemblances to mycelial structures, but our observations of the process as a whole lend no support to the mycotic theory and are definitely in agreement with the chemical or mechanical theory.

The size of the spleen decreases as the vascularity of the organ diminishes, as the hemorrhages and infarcts become organized and as the residual pulp becomes replaced by fibrous tissue. There is no direct correlation between the size of the spleen and the age of the patient. In general, the largest spleens are found in infancy and in early childhood, and small spleens are the rule in older children and in adults, but there are notable exceptions. Large congested spleens and small atrophic spleens have been found in infants and in adults, which indicates that the active disease may occur in varying age periods or that the rate of progression of the lesions is highly variable. The progressive decrease in size from a definitely palpable organ to one not palpable within a few years' time and a decrease in size following an acute febrile attack have been

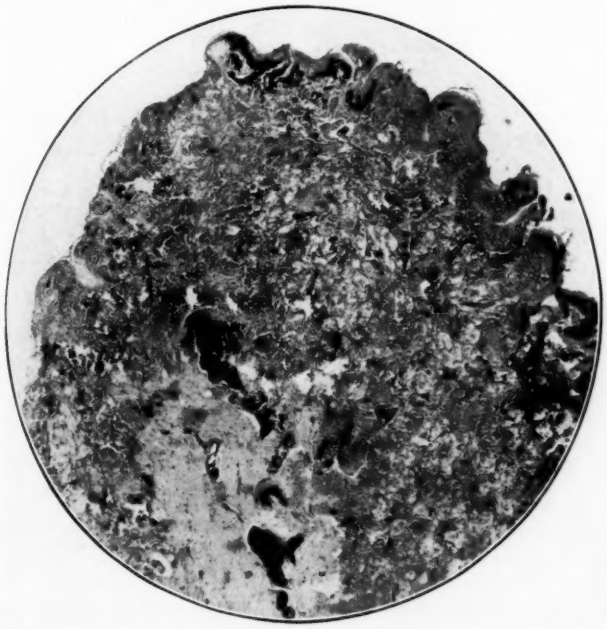

Fig. 6.—Section of a 2.4 Gm. spleen in sickle cell anemia (Dr. Steinberg's case). Complete replacement of pulp, massive fibrosis, calcification. Reduced from a photomicrograph with a magnification of 40 diameters.

clinically observed. Complete clinical and autopsy records are not available from which conclusions may be drawn as to the relationship of the splenic lesion to the severity and duration of the anemia.

Splenic infarcts have been found in patients complaining of severe pain in the left upper quadrant.

Splenectomy is advocated by some and used as a means of treatment. Final judgment as to the benefits to be expected cannot be made at the present time, but as the evidence now stands, and in spite of enthusiastic early reports, there is no proof that splenectomy causes a sustained improvement in the anemia or alters in any way the clinical course of the disease. Patients with sickle cell anemia are bad operative risks. If left alone, they will in effect "splenectomize" themselves without the benefit of surgery.

11. Reimann, H. A., and Kurotchkin, T. J.: Am. J. M. Sc. **181**: 107 (Jan.) 1931.
12. Fasiani, G. M. and Oselladore: Virchows Arch. f. path. Anat. **284**: 475, 1932.

ABSTRACT OF DISCUSSION

DR. JOHN C. CORRIGAN, Boston: It appears reasonable to conclude that, in sickle cell anemia, fibrosis with atrophy represents the ultimate stage in the changes that occur in the spleen. At the Boston City Hospital, a Negress, aged 23 years, who presented all the characteristic features of this disease, including the so-called abdominal crises, was found at necropsy, to have a spleen that could be identified by tracing the splenic artery. There was a progressive diminution in the size of the artery, with thickening of the wall and narrowing of the lumen as it approached the hilus of the spleen. The organ was atrophic in appearance and weighed 0.87 Gm. When the spleen was sectioned, many small foci of calcification were encountered. The surface had a small brownish gray appearance, and normal markings were absent. The capsule of the spleen was wrinkled. The parenchyma was composed of many trabeculae crowded together and a small amount of connective tissue. There were scattered areas of calcification in the capsule and trabeculae. The intima of the small arteries was thickened and their lumens were narrowed. No splenic pulp or malpighian corpuscles were present. It is interesting that this patient showed all the clinical manifestations attributed by some observers to splenic infarction. An explanation of the pains occurring in this disease has not yet been found. There is a group in which splenic infarction apparently accounts for the acute abdominal symptoms. The occurrence of abdominal pain in those with splenic atrophy to the degree described by Dr. Diggs and other writers on the subject makes it necessary to search for other explanations. The acute pains in this disease are not limited to the abdomen but may appear in the head, chest or extremities. We have a 27 year old Negress showing abdominal crises, who is also suffering from severe leg pains, followed by numbness and paresthesia in the legs for from three to ten days. This suggests involvement of the spinal cord. As far as I know, no specific changes in the spinal cord have been described. The pains encountered may be part of a thrombotic process of varying locations and degrees.

DR. CHARLES A. DOAN, Columbus, Ohio: I should like to ask Dr. Diggs whether he has observed the precipitation of an acute exacerbation of the anemia in patients with sickle cell disease following a major operation. A young adult female Negress was seen recently in our clinic complaining of typical gallbladder colic and on examination was found to have the characteristic blood changes of sickle cell anemia. An exploratory laparotomy was made by Dr. Curtis. The spleen could not be found at operation, but a gallbladder full of calculi was removed. Within forty-eight hours after the operation the patient developed an acute hemoclastic crisis, with marked jaundice, and died a few hours later with a high icteric index and a profound anemia. At autopsy a spleen weighing 10 Gm. was found enmeshed in fibrous tissue adherent to the diaphragm, and on section the characteristic microscopic changes so thoroughly illustrated by Dr. Diggs were demonstrated. Such a sudden hemolytic exacerbation precipitated by operation, together with certain other features common to sickle cell anemia, suggests an analogy to hemolytic jaundice. I am interested to know whether similar observations and similar deductions have been made in the study of the larger material available at Memphis.

DR. L. W. DIGGS, Memphis, Tenn.: Knowledge concerning the operative risk of patients with sickle cell anemia is limited. Instances of unexpected deaths during febrile crises and following operative procedures have been observed in this series and are recorded in the literature.

ADEQUATE CIRCULATION IN THE EXTREMITIES

ARTERIOGRAPHY AS A TEST FOR DETERMINING ITS LIMITS: PRELIMINARY REPORT BASED ON THIRTY AMPUTATIONS

J. ROSS VEAL, M.D.
WITH THE ASSISTANCE OF
ELIZABETH M. McFETRIDGE, M.A.
NEW ORLEANS

In peripheral vascular disease there is, as Mont Reid pointed out in the brilliant address he delivered as the first recipient of the Rudolph Matas Vascular Surgery Award, a vast and as yet almost untouched field of preventive medicine; but that does not alter the fact that prevention is possible only before the catastrophe has happened, never after it has come to pass. In other words, when once gangrene, the terminal phenomenon of vascular disease, is fully established, there can be no talk of prevention and there should, indeed, be little talk of conservatism; for impending gangrene is one thing, but frank gangrene is another and a very different thing. Gangrene will undoubtedly in the future be less and less of a problem among intelligent private patients, among whom, for that matter, it is no very great problem now; but it will undoubtedly always be a serious problem among ignorant and indigent public charges, and a problem, unfortunately, which admits of but one solution. Even the most capable of surgeons cannot save a limb that is beyond salvation when it is first seen, and there is no doubt that the surgeon who procrastinates in the presence of frank gangrene, however worthy his motives may be, adds to its death rate just as inevitably as does the patient who delays in presenting himself for treatment until his disease is fully established, or who refuses surgery when it is offered to him.

The question, then, in many cases of peripheral vascular disease is not whether to amputate but where to amputate, and that is by no means as simple as it sounds. If amputation is done high, according to the old law of Heidenhain that at a high level the circulation is more likely to be efficient than at a lower level, the percentage of recurrent gangrene is unquestionably less but the mortality is inevitably greater, for in all amputations the mortality is directly proportionate to the nearness of amputation to the trunk. Even if one chooses to ignore the question of future economic usefulness, which is always decreased in high amputations because of the difficulty of fitting a satisfactory artificial limb, one dare not ignore the risk of a heavily increased mortality, and routine high amputation, therefore, is no solution of the problem.

It is quite true that in a large number of cases, perhaps in the majority of cases, the clinical picture is so clear cut that the level of safe amputation is evident and the problem solves itself. But in many cases the clinical evidence is not conclusive or may be grossly inaccurate, and it is this group which has given rise to the various tests which have been devised for determining in frank gangrene the level at which the circulation is adequate and amputation may safely be done. Many of these tests, for one reason or another, are unworthy of practical consideration; but a few, notably the histamine reaction and the salt solution test, are enthusiastically advocated by some observers, while it is generally agreed that the use of the oscillometer gives a very high percentage of correct results. It is with some hesitancy, therefore, that we describe another test for determining the limits of adequate circulation in a diseased extremity, by direct visualization of the arterial supply, even though attempts along this line have been made for many years and have been unsatisfactory only because no agent was available that was at the same time safe and efficacious.

Some two years ago we began the study of the peripheral circulation in all types of peripheral vascular disease by means of arteriography with a stabilized solution of thorium dioxide, and to date we have used this method in more than 200 cases with increasingly satisfactory results from our own point of view and without immediate or remote harmful effects to the patient.

Our technic, which we have described in detail in previous communications,[1] we need mention only briefly. The patient lies on the table with the involved limb rotated outward, the leg partially flexed on the thigh, and the knee flat against the x-ray plate. In this position it is possible to visualize on a 14 by 17 film the upper two thirds of the leg and the lower third of the thigh, which is usually all that is necessary. Under local analgesia the femoral artery is punctured in the femoral triangle, and by digital pressure, applied just proximal to the site of puncture, the artery is occluded until the thorium dioxide solution has been introduced, firm pressure being continued until the injection has been completed. At the end of three

Fig. 1.—Diabetic gangrene of toes, with obliteration of anterior tibial artery but adequate circulation in upper half of leg. Amputation at site of election, with prompt healing.

From the Departments of Surgery of the Louisiana State University Medical Center and the New Orleans Charity Hospital.

1. Veal, J. R., and McFetridge, Elizabeth M.: Surgery of Gangrene of Extremities with a Study of 171 Cases from the Records of the New Orleans Charity Hospital, Surg., Gynec. & Obst., to be published; Technical Considerations in Arteriography of Extremities with Thorotrast, Am. J. Roentgenol. **32**: 64-71 (July) 1934; Arteriography in Gangrene of Extremities by Use of Thorium Dioxide (Thorotrast): Study Based on Twenty-Seven Cases, Ann. Surg., to be published.

seconds, which allows sufficient time for the solution to be distributed throughout the larger trunks and the smaller branches of the arterial tree, the exposure is made by the technic advised by Dr. Amédée Granger of the Department of Radiology, who has cooperated with us throughout this study: 45 milliamperes, 90 kilovolts, 35 inches, one second. The average dose of thorium dioxide is 20 cc.; 15 cc. is often sufficient, and we have never found it necessary to use more than 30 cc. Even this maximum quantity, it should be noted, is several

Fig. 2.—Arteriosclerotic gangrene of foot with partial obliteration of tibial arteries but adequate collateral circulation. Amputation at site of election, with prompt healing.

times less than the dosage established as well within the limits of safety by investigators of unquestioned verity who have used this agent in visualization of the liver and spleen. The injection is painless and nonirritating, and we have never seen the slightest evidence of arteritis or thrombosis, or any other untoward effect.

Our cases are divided into three groups. The first group includes only presumably normal patients and furnishes our standards of comparison. The second group includes patients with arteriosclerotic disease whose circulation is still adequate, and the third group includes patients with frank gangrene. From the study of these groups of cases we have been able to devise certain criteria by which we can distinguish between normal and pathologic vascular states. In normal subjects the most striking characteristic of the injected vessels is the distinct and regular vascular pattern, which fades out gradually as the most delicate terminals are reached, and the orderly arrangement, so to speak, of the arterial supply, which extends to the ends of the toes. All the vessels, furthermore, are visualized, even the fine branches that arise directly from the large trunks. In diseased vessels, on the other hand, the main arterial supply is heavy, uneven, wavy and tortuous. The smaller vessels end abruptly rather than fade out, and the fine branches, which arise directly from the main trunks, are not visualized. The muscular branches are also very irregular, while the number of finer branches visualized is fewer than in the normal state. The lumens are markedly narrowed, and plaques of calcium are often seen in the vessel walls. The existence of a collateral circulation is direct evidence of disease, and its irregularity is characteristic.

From these criteria, which make the distinction between normal and diseased vessels, we have been able to set up other criteria to determine the limits of adequate circulation, which are based on the following considerations:

1. The presence of arterial occlusion.
2. The size of the large arteries above and below the knee.
3. The number of muscular and skin branches, their size and their distribution.
4. The efficiency of the collateral circulation.

All of these criteria are carefully weighed, both absolutely and in their relation to one another, and the mere existence of arterial occlusion is by no means taken to indicate that the circulation at that level is inadequate; an evaluation of other factors is necessary before the significance of the occlusion can be determined. Thus, to speak specifically, if there is complete occlusion of the tibial artery (figs. 1 and 2), but if the arterial tree in the middle or upper third of the leg approaches the normal pattern in the number, size and distribution of the vessels, amputation can safely be done in the upper or even the middle third of the leg. If there is complete obliteration of the popliteal artery (fig. 3),

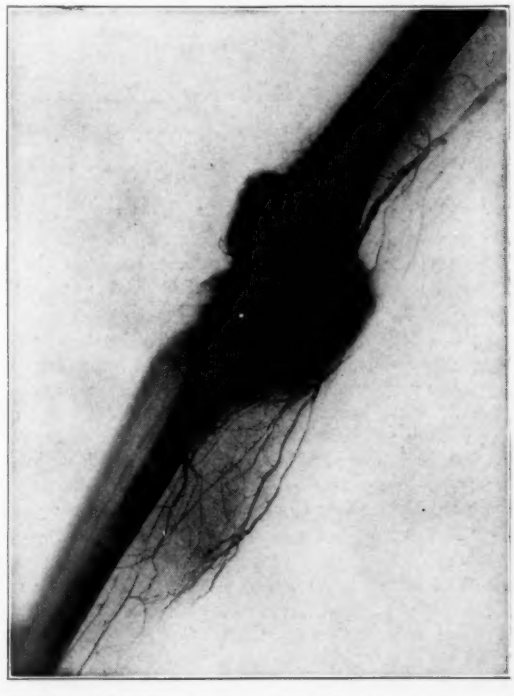

Fig. 3.—Arteriosclerotic disease, with obliteration of popliteal artery but adequate collateral circulation.

but if the collateral circulation in the middle and upper thirds of the leg provides an adequate number of skin and muscle branches, amputation can still be safely done below the knee. On the other hand, even though the large trunks should be patent, if the skin and muscle branches are materially diminished in size and number (figs. 4 and 5), the circulation is plainly inadequate and amputation must be done above the knee.

In the light of these criteria we have studied thirty consecutive cases of gangrene of the extremities as the

result of peripheral vascular disease, for which thirty-one amputations were done, twenty-three of which, including two on the toes, were below the knee. Four reamputations were required in this group:

CASE 1.—A Negro woman, aged 60, had diabetic gangrene involving one third of the foot. Arteriography demonstrated obliteration of the popliteal artery at one point, with marked narrowing of the remaining channel as well as of the whole

Fig. 4.—Arteriosclerotic gangrene of foot, with marked sclerosis and narrowing of vessels, and diminution in number of muscle and skin branches. Amputation at the lower third of the thigh, with healing.

anterior tibial artery. The collateral circulation, however, was apparently abundant and well distributed, and amputation at the site of election was considered safe. Two days after operation, reamputation was done for gas bacillus infection of the stump and the patient did not survive.

CASE 2.—A Negro man, aged 40, had arteriosclerotic gangrene involving one third of the foot. Arteriography demonstrated the popliteal artery and the large branches to be patent and the lumens to be fairly large, while the collateral circulation seemed adequate in both the distribution and the number of the branches. Amputation was done at the site of election, and, as in the first case, reamputation was necessary for a gas bacillus infection of the stump. The patient died ten days later, from pneumonia.

CASE 3.—A Negro woman, aged 60, had diabetic gangrene involving one half of the foot. Arteriography demonstrated the anterior tibial artery to be completely occluded, but the posterior tibial, although narrowed, was patent, as was the popliteal artery. The collateral circulation appeared to be fairly adequate, and we advised amputation at the site of election, although we believed at the time that our advice was open to question. Events proved the soundness of our doubts, for reamputation was necessary five days after the original operation for recurrent gangrene of the stump. The patient survived.

CASE 4.—A Negro woman, aged 63, had arteriosclerotic gangrene involving three toes. Arteriography demonstrated the popliteal and both tibial arteries to be patent, although somewhat narrowed. There was some reduction in the number of skin and muscle branches, and again we consider our advice to amputate at the site of election rather questionable. Five days after the first operation an infection, associated with marked crepitation of the tissues, was evident in the stump, and reamputation was done on the clinical diagnosis of gas bacillus infection, which was not, however, confirmed by the laboratory. The patient survived.

Undoubtedly all these cases must be charged up against arteriography as a means of determining the limits of adequate circulation, though in the last two we realized, at the time we gave it, that our advice was open to question and the unsuccessful outcome should be attributed rather to our interpretation of the arteriographs than to any defect in the method itself. In the first two cases the gas bacillus infection may have been the result of an external contamination; but since this organism thrives best in poorly vascularized tissues there seems no doubt that we must again assume the responsibility for the mistakes.

Studying the thirty cases from the standpoint of the vascular disease, twenty-one exhibited arteriosclerotic gangrene, eight, in one of which bilateral amputation was necessary, exhibited diabetic gangrene, and one exhibited Buerger's disease. In the last case amputation was necessary at the lower third of the thigh, as it was in seven of the twenty-one cases of arteriosclerotic gangrene. In all the cases of diabetic gangrene, amputation was done at the site of election.

In one case the gangrene was confined to the heel and in nine others to the toes; in only one case in this group was amputation necessary above the knee, and in two cases amputation of a single toe was sufficient. In seven cases a third of the foot was involved, and in two of these amputation was necessary above the knee. In thirteen cases half or more of the foot was involved, and in five cases amputation was necessary above the knee, with three fatalities. In only one of

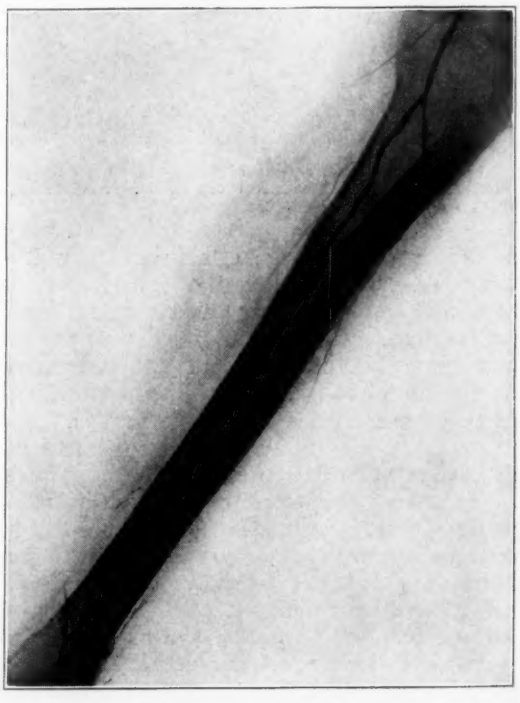

Fig. 5.—Arteriosclerotic gangrene of foot, with narrowing of popliteal and tibial arteries, and rather scanty muscular and skin branches. Amputation at lower third of thigh, with prompt healing.

the eight cases, however, in which amputation was done at the site of election, was there a fatal outcome.

The mortality for the whole group of thirty cases is seven, 23.3 per cent, and while the series is too small for fair comparison with the series of 171 cases of gangrene we have recently reported, in which the mortality was 39.1 per cent, or with Eliason's series of 175 cases, in which the mortality was 41.8 per cent,

certainly the decrease in the death rate is striking enough to warrant comment. Analyzing the figures more critically, it is noteworthy that the mortality for the eight cases of amputation above the knee is 50 per cent (four cases) as compared with a mortality of only three cases, 13 per cent, for the twenty-three amputations done below the knee, even when reamputations are included. Of the wisdom of performing amputation at the lowest possible level there can be no question from the standpoint of mortality. Eliason's mortality of 41.8 per cent is undoubtedly to be at least partially explained by the fact that he does the high amputation in more than three fourths of his cases, while in our own series of 171 cases, which is large enough to permit of fair comparisons, the mortality for amputation above the knee was 55 per cent, as compared with a mortality of 37 per cent for amputation at the site of election.

Fig. 6.—Recurrent gangrene of stump. Note narrowing of tibial arteries and diminution in number of muscular and skin branches.

As a check on our arteriographs we have used the salt solution test (by the method of McClure and Aldrich) and the histamine reaction test (by the method of Lewis and de Takáts) in fourteen cases, six of which were cases of frank gangrene that required amputation. In both tests we used eight punctures, running from the middle third of the thigh to just above the ankle. In the histamine reaction test, in all cases the first and second punctures indicated adequate circulation, but in only two cases, both without gangrene, did it indicate adequate circulation below the knee. Other observers claim with this test a high percentage of correct diagnoses, but in our hands it was clearly open to very serious error. The salt solution test corresponded with our arteriographic studies in 80 per cent of the cases, though in one instance it indicated adequate circulation below the knee when both arteriography and dissection after high amputation proved the blood supply to be wholly inadequate. This test, moreover, is valueless when the gangrene is accompanied, as it so frequently is, at least in this hospital, by edema and inflammatory reaction. We have no hesitancy in saying, therefore, that arteriography is a very much more reliable index of the limits of adequate circulation than is either the histamine reaction or the salt solution test, though we have not had, as yet, an opportunity to check it against oscillometric readings.

On the other hand, we make very guarded claims for the worth of arteriography. We by no means claim that the marked reduction in mortality which this group of thirty cases shows, as compared to the mortality we recently reported in a group of 171 cases of gangrene, 23.3 per cent against 39.1 per cent, is entirely, or even chiefly, due to its use. It is only fair to point out that the majority of these amputations were done in our own service, in which it is the policy of the entire staff to surround with every possible protection the patient who has gangrene. We amputate without delay in the presence of frank gangrene, we prepare the patient carefully by the use of fluids by all routes, our postoperative care is equally meticulous, we check the cardiac and renal reserve in all cases, and we handle diabetic gangrene only with the close cooperation of a competent internist. But we do claim that the use of this test, in conjunction with other tests the worth of which has been established, and in conjunction with the proper preoperative and postoperative therapy, will furnish one more safeguard for the patient with gangrene of the extremities. Furthermore, since the harmlessness of the stabilized solution of thorium dioxide has been established, and since the injection is only slightly more complicated than the taking of a simple roentgenogram, we can see no objection to the employment of the method at least in those clinics in which radiography of the extremities is part of the routine of the management of peripheral vascular disease.

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Clinical Notes, Suggestions and New Instruments

ENTRANCE OF IODIZED OIL INTO THE VENOUS CIRCULATORY SYSTEM DURING UTEROGRAPHY

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Intra-uterine injections of oily opaque substances for diagnostic and therapeutic purposes has become an ordinary everyday procedure in the hands of gynecologists. Very few untoward accidents or sequelae have been reported in the literature to date. The complications most frequently mentioned are peritoneal irritations, localized inflammatory processes, exacerbations of chronic or subacute inflammations in the pelvis, and iodism due to the resorption of the customary iodine ingredient of the injected liquid.

The following is a report of an unusual accident occurring during an intra-uterine injection of iodized oil:

M. L., a woman, aged 35, a Negress, was admitted to the Sterility Clinic of the Harlem Hospital, March 14, 1932. Her only complaint was her sterile marriage of six years' duration. A laparotomy, performed seven years before admission, revealed uterine myoma and left salpingitis with adhesions. Appendectomy, myomectomy and left salpingectomy were performed. She had periodic attacks of bronchial asthma. Her husband seemingly was healthy. She had never conceived. Menstruation, which had begun in her sixteenth year, was regular every twenty-eight days, of one or two days' duration, scanty in amount and not painful.

Gynecologic examination revealed normal external genitalia. The vagina was roomy, the cervix central and conical, and the external os was pointed. The uterus was in anteflexion-version, was freely movable, was rather small, was of normal consistency and was ovoid. The surface was even. The adnexa were normal. The vaginal secretion was normal. A cervical smear was negative for gonococci. The Wassermann reaction was negative. A condom specimen of the husband's semen examined four hours after coitus showed many motile spermatozoa.

The insufflation test, performed March 14, revealed patency at 60 mm. pressure.

From the Gynecological Division of the Surgical Service of Harlem Hospital.

In order to see graphically the effects of the previous operation on the uterus, a roentgenogram was taken, May 1, following the injection of 8 cc. of iodized poppy-seed oil. The last menstruation occurred April 27-28. Subsequently the patient reported that instead of the customary staining for a day or so she bled for four days but had no other ill effects.

The immediate picture (fig. 1) showed the cavity of the anteflected uterus well filled, the right tube patent, the left tube missing. Free oil was in the abdominal cavity. Besides these normal observations, the whole venous system of the uterus was filled with oil, a large quantity being found in the right vena ovarica. The twenty-four hour picture showed some remnants of iodized oil in the free abdominal cavity, the cavity of the uterus and the venous system not visualized (fig. 2).

COMMENT

A similar case was reported in the literature recently by Kilroe and Hellman.[1] In their case a nullipara was injected with iodized poppy-seed oil. An anteflexed uterus was visualized with both tubes patent. The venous system of the uterus was filled with oil and both venae ovaricae were visible. Exactly the same picture was obtained after a repeated oil injection ten days later. The venous system was filled with oil and the tubes were patent. No ill effects were reported after these injections.

Analyzing these almost identical reports, one must emphasize that the iodized oil which escaped into the circulatory system was not injurious and did not cause any noticeable symptoms.

To determine the etiology of these accidents, the following possibilities should be considered:

1. Excessive pressure during the injection.
2. Pathologic permeability of the uterine vessels.
3. Injury to the uterine wall.

1. Excessive pressure. This possibility might be excluded on the ground that in both cases the tubes were found patent. Furthermore, if excessive pressure alone should be sufficient to produce this occurrence, it would be observed much more frequently, particularly in cases in which there are closed tubes.

2. Pathologic permeability of the uterine vessels. Kilroe and Hellman are inclined to believe that in their case a pathologic permeability of the uterine vessels was present. They arrived at this conclusion because they obtained identical pictures following the second injection. In their case this explanation is very suggestive, owing to the fact that the uterine circulatory system was entered on two successive occasions. In an attempt to prove this explanation in the present case, iodized oil was injected on four subsequent occasions after monthly intervals. On none of these occasions did the oil escape into the circulatory system. Kilroe and Hellman proceeded with their second injection after a ten days interval. In the present case the interval was of one month's duration. Ample time was allowed for the repair of any injured uterine mucosa.

Fig. 1.—Appearance immediately after injection of iodized oil: anteflected uterus; right tube patent; left tube missing; free oil in the abdominal cavity; the whole venous system of the uterus filled with oil; large quantity in the right vena ovarica.

3. Injury to the uterine wall. This seems to be the cause in the present case. It is substantiated by the report of the patient that she had a vaginal bleeding of four days duration after the injection. It would seem that a simple injury produced by the injecting cannula to a normal uterine mucosa would not be sufficient to facilitate such an occurrence. It probably would require the injury of a venous sinus. In the present case the previously performed myomectomy might have facilitated the injury of such a vessel. In the recent literature over twenty-five lethal cases have been reported following the injection of an oil into the uterine cavity to produce an abortion. Autopsy showed these deaths to be due to an oil embolus (Nieslony,[2] Brack,[3] Haselhorst[4]). It must be emphasized again that the iodized oil was not injurious to the patients, whereas the abortion producing oils with their toxic ingredients caused death (Franken[5]).

Fig. 2.—Twenty-four hours after injection: remnants of oil in the free abdominal cavity.

SUMMARY

1. In a case in which iodized oil was injected into the uterus, the opaque substance filled the entire uterine venous system.

2. Injury to a pre-existing large sinus was the probable explanation for this rare occurrence.

3. The injected iodized oil is apparently not injurious, whereas medicated abortion producing oils have produced death following the same accident.

2715 Grand Concourse.

1. Kilroe, J. C., and Hellman, A. M.: Am. J. Obst. & Gynec. **25:** 152 (Jan.) 1933.

2. Nieslony, F.: Zentralbl. f. Gynäk. **56:** 2193 (Sept. 3) 1932.
3. Brack, E.: Zentralbl. f. Gynäk. **56:** 122 (Jan. 9) 1932.
4. Haselhorst: Deutsche med. Wchnschr., 1932, no. 4.
5. Franken, Herman: Zentralbl. f. Gynäk. **56:** 1282 (May 21) 1932.

COSTOVERTEBRAL DISLOCATION OF THE FIRST AND SECOND RIBS

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AND
H. R. REICHMAN, M.D., EVANSTON, ILL.

Dislocation of the ribs at the costovertebral articulation is so extremely rare that the present case seems to merit reporting.

Stewart and Warren[1] in 1929 described a case of dislocation of the first rib. They made an exhaustive study of the literature and found only thirteen cases, including their own, in nearly two hundred years. These authors presented a brief summary of the reported cases. Since that time Brooksher[2] has reported another case, a dislocation of the twelfth rib. He also refers to Schertlein,[3] who reported an isolated case of costovertebral dislocation of the first rib. Schertlein states that there is but one recorded case in the German literature from 1909 to 1929 and cites Riedinger, who in 1888 compiled nine cases from the literature, of which only one case could be regarded as true luxation. Bohle[4] has since reported two cases, making in all a total of nineteen reported cases. Of these the luxations were three cases each of the first rib, twelfth rib and eleventh and twelfth ribs in combination, one case each of the sixth and seventh, eighth and ninth, and tenth and eleventh ribs in combination, one case of the sixth, eleventh, fourth and seventh ribs, one case in which two of the sixth, seventh or eighth ribs were dislocated,[5] and two cases in which the dislocated rib was not specified.[3]

1. Stewart, S. F., and Warren, J. W.: Luxation of the Costovertebral Joints, J. A. M. A. **92:** 605 (Feb. 23) 1929.
2. Brooksher, W. R., Jr.: Costovertebral Dislocation of the Twelfth Rib, J. A. M. A. **100:** 816 (March 18) 1933.
3. Schertlein, A.: Fortschr. a. d. Geb. d. Röntgenstrahlen **39:** 482-485 (March) 1929.
4. Bohle, W.: Arch. f. orthop. u. Unfall-Chir. **27:** 269-272 (May 23) 1929.
5. Boudet, M.: Société anatomique **14:** 104, 1839 (quoted by Stewart and Warren).

The case here presented is particularly interesting, as both the first and second ribs were dislocated at their costovertebral articulations, a condition not previously reported.

REPORT OF CASE

R. L., a white man, aged about 30, was admitted in an unconscious condition to the outpatient department of the Evanston Hospital, Aug. 10, 1934, following an accident in which he and eight others were injured, when a truck which he was driving was struck by a train. Regaining consciousness soon after reaching the hospital, he complained of severe pain in the neck and abdomen. He was very nauseated and vomited several times. There was a laceration about 4 cm. in length over the right frontoparietal region, bleeding profusely, and marked swelling and ecchymosis around the eyes, particularly the right. There was no bleeding or fluid discharge from the ears, nose or throat. The neck was held rigid and there was a point of maximum tenderness at the left posterior aspect of the base of the neck near the point of articulation of the first rib with the vertebra. The examination of the thorax was negative. The abdomen was rigid, particularly in the epigastrium. The extremities were negative except for several minor abrasions. The deep and superficial reflexes were present and no abnormal reflexes could be elicited.

A leukocyte count taken on admission was 21,000. The leukocyte count diminished until twelve hours later, when it was

Upper dislocation of the first and second ribs on the left side.

11,950. The erythrocyte count at that time was 3,800,000; hemoglobin, 71 per cent. At no time was the urine examination abnormal.

Because of the serious condition of the patient, no roentgenograms were taken on the night of admission. The indications for laparotomy for a ruptured internal viscus became less each hour. Owing to the patient's persistent complaint of pain in the neck and the possibility of a cervical dislocation or fracture, the head was placed in a halter and three pounds of traction applied to the neck.

A roentgen study of the neck was made on September 13. The roentgenologist, Dr. E. R. Crowder, made the following report: "After rather careful consideration I am quite inclined to believe that we are dealing with an upward dislocation of the head of the first and second ribs on the left side. This I realize is a very unusual type of injury and certainly not a very probable injury but I am not able to explain the asyemmetry of these ribs in any other way. There is no x-ray evidence of injury to the bodies of any of the cervical vertebrae nor to the spinous processes." Subsequent roentgen examination revealed a fracture of the right frontal bone. With these observations the traction was removed and all active treatment to the neck discontinued.

The patient was treated conservatively for skull fracture with rest in bed and 50 per cent dextrose intravenously as indicated by his symptoms. Open reduction of the dislocated ribs was considered. Because of the head injury, however, any operative treatment that was not imperative was deemed inadvisable.

The patient was closely watched for any impairment of nerve or circulatory function of the upper extremity, but none was observed. The pain and stiffness of the neck gradually disappeared. The patient was discharged on the thirty-fifth day with no complaints. At this time he had full, painless motion of the neck and there was no disturbance in function, nor any abnormalities in the left arm.

636 Church Street.

POTT'S ABSCESS OF THE SPINE OPENING INTO THE BRONCHI

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Cases of Pott's disease of the spine with abscess opening into the bronchi are rare. The history of such a case is therefore reported.

REPORT OF CASE

A Mexican boy, aged 8 years, admitted to the General Hospital of Fresno County, June 5, 1933, had had fever and cough for a period of three months. During the last two months the cough had become productive of blood and pus. Three days before admission a high fever had developed. The boy complained of pain in the chest and coughed up some blood. When admitted he was emaciated and appeared ill. The temperature was 103.4 F., the pulse rate 124 and the respiration 26 per minute. There was dulness in the right upper part of the chest and râles were present throughout the entire right lung. The heart was not enlarged and there were no murmurs or thrills. Nothing further was found on examination. The child's father had died of pulmonary tuberculosis.

The laboratory report showed the blood to contain 3,300,000 erythrocytes per cubic millimeter. The hemoglobin was 44 per cent. The white cells were 12,700, of which the polymorphonuclear leukocytes were 75 per cent, large lymphocytes 4 per cent and small lymphocytes 21 per cent. The bleeding time and the coagulation time were three minutes. The specific gravity of the urine was 1.104. It was alkaline and negative for sugar and albumin. Microscopically there were a few leukocytes. The sputum was negative for acid fast bacilli. Roentgenologic examination of the chest showed extensive infiltration in the right upper lobe. Through the entire length of the mediastinum there was a dense fusiform shadow, which on fluoroscopy was seen to be posterior. A diagnosis of tuberculosis was made, with mediastinitis to be considered. A Mantoux test with 1 mg. of old tuberculin gave a 3 plus reaction in forty-eight hours.

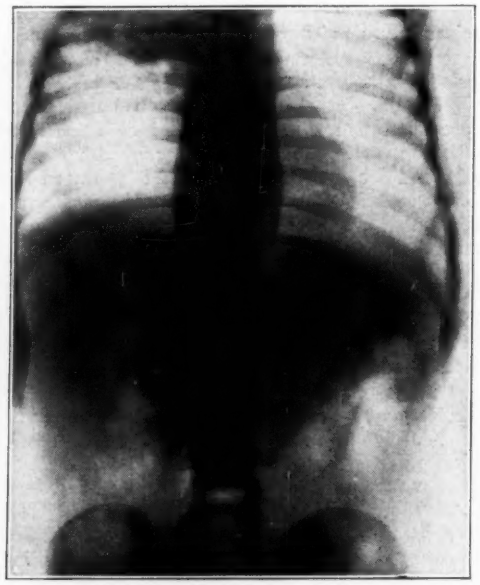
The child was isolated and all the therapeutic measures for tuberculosis were instituted. Because of the sitting posture, discussion arose as to the presence of spinal caries, and another roentgenologic examination was made. There was considerable rarefaction of the mid-dorsal vertebrae and of the intervertebral space between the eighth and ninth dorsal vertebrae. There was also an infiltration in the adjacent mediastinum. An additional diagnosis of tuberculosis of the dorsal spine was therefore made. After consultation with the surgical staff, it was decided to tap the mediastinum. This was done, August 1, and 40 cc. of yellow pus was drawn off. Two days later, 65 cc. of pus was removed. Smears showed pus and many bacteria; no acid fast organisms were seen. Cultures grew as short chain streptococci and gram-positive bacilli. Guinea-pig inoculations were negative.

In view of the laboratory examination the diagnosis of tuberculous abscess was doubted and the patient was transferred to the surgical section. August 10, in an attempt to drain the abscess, an incision was made in line with the ribs in the eighth intervertebral space just to the right of the spinal column. Muscles and fascial planes were separated and forceps inserted into the posterior mediastinum. No pus was obtained. Repeated probing of the posterior mediastinum showed no pus.

The patient continued to have a septic temperature ranging from 97 F. in the morning to 104.8 in the evening. His appetite was good, however, and his cheerfulness was remarkable. August 18 it was noticed that he was developing a dorsal kyphosis and was placed on a Bradford frame. He continued to rest comfortably and had no symptoms excepting cough and fever. September 29 a trocar was introduced into the posterior mediastinum and pus was again obtained. Through the trocar blowing sounds, which synchronized with inspiration and expiration, could be heard, indicating that there was a bronchial fistula. No drainage was obtained by means of a rubber tube, which was left in place. Postural drainage seemed to help more and was carried out several times daily. The drainage tube was consequently removed.

October 21, 35 cc. of pus was drawn from the mediastinal abscess and 15 cc. of gentian violet injected into the abscess cavity. Almost immediately the patient had a violent fit of coughing and expectorated much of the dye and a quantity of pus.

November 2 he complained of severe pain around the heart. There was marked pulsation over the entire precordial area. The breath sounds were roughened throughout, with coarse râles especially over the right lung. The abdomen contained



Appearance of chest, showing dense fusiform shadow due to Pott's abscess of the posterior mediastinum communicating with the bronchi.

free fluid and there was tenderness over a palpable liver. The spleen was not palpable. November 4, pus was again obtained by aspiration and a catheter was left in the abscess cavity. About one week later the child coughed up a considerable quantity of pus. His pulse rate went to 144 per minute but was regular and fairly strong. December 9 a longer drain was inserted and irrigations with metaphen 1:4,000 were begun three times daily. Two days later the child pulled the drain out. However, the opening was adequate and drainage moderate. He continued to cough and expectorate pus; he was dyspneic and cyanotic, and his abdomen was greatly distended until he died, December 14, six months after admission.

At autopsy by Dr. C. A. Nixon, both pleural cavities were seen to have extensive fibrotic adhesions. Both lungs showed disseminated tuberculosis throughout, with a cavitation about 8 cm. in diameter in the right apex and a fairly large area of caseous pneumonia in the left upper lobe. The mediastinum contained very little free pus but did show granulation of the tissues. There was erosion of the vertebral bodies, which was so marked that they could be crumpled away with the finger.

COMMENT

Cases of Pott's abscess opening into the bronchial system are reported chiefly in the French literature. In 1928 a case was presented before the Société de pédiatrie de Paris by Mayet and Genevrier.[1] Their report concerned a boy aged 16 years, who had had Pott's disease of the dorsolumbar spine for six years. After injection of a fistula with iodized oil the boy was seized with violent coughing. The iodized oil was seen on roentgenologic examination to have entered the right bronchus. Apparently some improvement followed this procedure.

Mayet and Genevrier referred to this condition as being extremely rare, usually occurring as an accident preceding death. They cited fifteen cases, which were reviewed in the Cremieux thesis (Thèses de Paris 1875) but stated that since then very little reference had been made in the literature to such a finding. In the discussion following the presentation of their case, a similar incident was reported by Solon Veras, who had seen a patient become suffocated and cough up fluid following an injection into a fistulous opening in a Pott's abscess. Lance, in the same discussion, voiced the opinion that these cases were not so rare as appeared but were not recognized and might exist in a latent condition. He had once injected hydrogen dioxide into a small dorsal fistulous opening, which had persisted for several years following dorsal Pott's disease. The patient had a violent fit of coughing with the expectoration of hydrogen dioxide foam. Lance believes that unless the abscess opens also into the pleural cavities the opening into the bronchus is not a serious menace to long life.

In the case here recorded the diagnosis of abscess opening into the bronchus was not established until the injection of the gentian violet, which was followed by an attack of coughing and the appearance of the dye in the mouth.

2014 Tulare Street.

Special Articles

GLANDULAR PHYSIOLOGY AND THERAPY

GENERAL PHYSIOLOGY OF THE ANTERIOR HYPOPHYSIS

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NOTE.—*These articles and those in* THE JOURNAL *last week are part of a series published under the auspices of the Council on Pharmacy and Chemistry. Other articles will appear in succeeding issues of* THE JOURNAL.—ED.

Although the general physiology of the anterior hypophysis is inseparable from its special physiology, a general discussion of the recent developments of our knowledge of pituitary physiology may be of value. Experimental and other work is increasingly showing the important position which this organ occupies among the endocrine glands. There appear to be but few body functions that it does not influence, either directly or indirectly. Barger has spoken of it as "general headquarters" of the endocrine system, a characterization that aptly expresses its dominant position in this system.

Undoubtedly, the large number of contributions that have been publishd on the anterior hypophysis within the last decade have not simplified but rather have made more complex our knowledge of its physiology. Thus, in 1927 two hormones, a growth and a gonadotropic hormone, had been demonstrated. The stimulating effects on the growth of normal rats, first shown by Evans and his collaborators,[1] and the pronounced restorative effects of anterior pituitary gland adminis-

1. Mayet and Genevrier: Pott's Fistulized Abscess in the Bronchial Tubes, Bull. Soc. de pédiat. Paris **26**: 94-98 (Feb.) 1928.

From the Department of Anatomy, Columbia University College of Physicians and Surgeons.

1. Evans, H. M.; Meyer, K., and Simpson, M. E.: The Growth and Gonad-Stimulating Hormones of the Anterior Hypophysis, Memoirs of the University of California **2**, 1933.

tration on growth in rats dwarfed by hypophysectomy,[2] promised much for the clinical treatment of pituitary dwarfism. The outspoken stimulation of the gonads of immature normal rodents reported from this country and from Germany (Smith and Engle,[3] Zondek [4]) and the reparative effects on the atrophied reproductive organs of hypophysectomized rats [5] suggested the imminence of a successful clinical treatment of underfunction of the gonads. Indeed, the supra-ovulation obtained at that time [3] indicated that such therapy might be too successful and might lead to the liberation of an undesired number of ova. Although the evidence at that time thus indicated that the anterior lobe elaborated two hormones, a growth and a gonadotropic hormone, other observations suggested that the problem might become more complex. Hypophysectomy was found to cause not only an arrest in growth and atrophy of the gonads but also involution of the thyroids and the adrenals in mammals.[2] It was not known at that time whether the stimulation of the thyroid and the adrenal was effected by the growth or by the gonadotropic hormone or by another pituitary hormone or hormones.

Although it was not demonstrated until this time that ablation of the anterior pituitary caused an involution of the adrenals and thyroids, it should not be overlooked that earlier work (Allen,[6] Smith [7]) had revealed these responses in amphibia more than ten years previously, and although hyperplasia of the thyroid in birds [8] and in mammals (Loeb,[9] Aron,[10] Watrin [11]) was not described until 1929-1930, hyperplasia of the thyroid from pituitary administration had been secured in 1922,[12] which has not been exceeded in subsequent mammalian experiments. Attention might also be called to the fact that a chromatophore stimulant from the pituitary reported by Zondek [13] in 1932 and named by him "intermedin" had been demonstrated in 1916 by both B. Allen and P. E. Smith and was subsequently extensively studied by them and other investigators. Indeed a monograph of this subject appeared in 1924.[14] Thus the assumption that, because he applied a new name and emphasized the specific pigmentary reactions of a species of minnow, Zondek uncovered a new hormone is quite erroneous.

2. Smith, P. E.: Hypophysectomy and a Replacement Therapy, Am. J. Anat. **45**: 205 (March) 1930.

3. Smith, P. E., and Engle, E. T.: Experimental Evidence Regarding the Rôle of the Anterior Pituitary in the Development and Regulation of the Genital System, Am. J. Anat. **40**: 159 (Nov.) 1927.

4. Zondek, Bernhard: Ueber die Funktion des Ovariums, Ztschr. f. Geburtsh. u. Gynäk. **90**: 372, 1926; Die Hormone des Ovariums und des Hypophysenvorderlappens, Berlin, Julius Springer, 1931.

5. Smith, P. E.: The Disabilities Caused by Hypophysectomy and Their Repair, J. A. M. A. **88**: 158 (Jan. 15) 1927.

6. Allen, B. M.: Effects of the Extirpation of the Anterior Lobe of the Hypophysis of Rana Pipiens, Biol. Bull. **32**: 117, 1917.

7. Smith, P. E.: The Pigmentary, Growth and Endocrine Disturbances Induced in the Anuran Tadpole by the Early Ablation of the Pars Buccalis of the Hypophysis, Am. Anat. Mem., 1922, No. 11.

8. Schockaert, J.: À propos de la spécificité de l'action stimulante des extraits préhypophysaires sur la thyroïde, Compt. rend. Soc. de biol. **105**: 223 (Oct. 24) 1930.

9. Loeb, Leo, and Bassett, R. B.: Effect of Hormones of Anterior Pituitary on Thyroid Gland in the Guinea-Pig, Proc. Soc. Exper. Biol. & Med. **26**: 860 (June) 1929.

10. Aron, M.: L'hormone préhypophysaire excito-sécréteur de la thyroïde, Rev. franç. d'endocrinol. **8**: 472 (Dec.) 1930.

11. Watrin, J.: L'hémocrinie hypophysaire, Rev. franç. d'endocrinol. **8**: 193 (June) 1930.

12. Smith, P. E., and Smith, I. P.: The Repair and Activation of the Thyroid in the Hypophysectomized Tadpole by the Parenteral Administration of Fresh Anterior Lobe of the Bovine Hypophysis, J. M. Research **43**: 267 (June-July) 1922.

13. Zondek, Bernhard, and Krohn, H.: Hormon des Zwischenlappens der Hypophyse (Intermedin), Klin. Wchnschr. **11**: 405 (March 5) 1932.

14. Hogben, L. T.: The Pigmentary Effector System, Edinburgh, 1924.

THE PITUITARY HORMONES

The growth hormone has continued to be intensively studied since its discovery in 1922 by Evans and Long.[15] It has maintained its position as a separate principle, although preparations of it are usually not pure, physiologically. Consistent results have been reported on its injection into normal rats that had passed the period of maximum rate of growth. The female shows a better response than the male. Marked restorative effects in rats dwarfed by hypophysectomy have been reported from a number of laboratories. Some striking effects in normal dogs have been reported,[16] whereas in other cases no effect was secured even with very prolonged treatment.[1] These different results appear to be due to a difference in the responsive capacity of the end organ (receptor tissues), a phase of hormone studies which is of great importance.

Treatment of a sufficient number of clinical cases has now been reported in which a growth stimulation has been secured to make it seem certain that injections of the growth hormone will be effective, in some cases at least.[17] In these cases treatment was instituted much before the time at which the puberal growth spurt would normally appear, so that a lack of due regard for this factor does not invalidate the results. Unfortunately, this cannot be said of the reports, which still frequently appear, on the stimulation of growth from the feeding of pituitary tablets. The relationship of the pituitary growth hormone to other endocrine glands, especially the thyroid, needs further investigation. It has been reported that the concurrent administration of growth hormone and thyroid gives greater skeletal growth in rats in which both the hypophysis and the thyroids have been ablated than does the administration of the same doses of the growth hormone alone.[18]

Although, as already mentioned, it was shown nearly two decades ago in amphibia that pituitary ablation resulted in an atrophic condition of the thyroids and the adrenal cortex and that anterior pituitary replacement therapy would restore these glands to a normal condition, these observations were not confirmed in mammals until 1927.[5] It has since been shown that administration of anterior lobe causes an enlargement of the thyroid in normal doves and pigeons [19] and a marked enlargement and hyperplasia of this gland together with exopthalmos in normal ducks [20] and normal mammals (Loeb and Bassett,[9] Aron [10] and others). Although the stimulation of the thyroid has not been maintained in chronic treatments, nevertheless these observations are proving of great value, not only in determining whether or not the thyrotropic principle is a separate hormone but also in studying the secretory process of the thyroid gland

15. Evans, H. M., and Long, J. A.: The Effect of Anterior Lobe Administered Intraperitoneally upon Growth, Maturity and Oestrus Cycles of the Rat, Anat. Rec. **21**: 62, 1921.

16. Putnam, T. J.; Benedict, E. B., and Teel, H. M.: Studies in Acromegaly; Experimental Canine Acromegaly Produced by Injection of Anterior Lobe Extract, Arch. Surg. **18**: 1708 (April) 1929.

17. Engelbach, William, and Schaefer, R. L.: Endocrine Dwarfism, Endocrinology **18**: 387 (May-June) 1934.

18. Smith, P. E.: Increased Skeletal Effects in Anterior Pituitary Growth-Hormone Injection by Administration of Thyroid in Hypophysectomized, Thyroparathyroidectomized Rats, Proc. Exper. Biol. & Med. **30**: 1252 (June) 1933.

19. Riddle, Oscar, and Polhemus, I.: Studies on the Physiology of Reproduction in Birds, Am. J. Physiol. **98**: 121 (Aug.) 1931.

20. Schockaert, J. A.: Enlargement and Hyperplasia of the Thyroids in the Young Duck from the Injection of Anterior Pituitary, Am. J. Anat. **49**: 379 (Jan.) 1932.

itself. Experimental work indicates that the thyrotropic principle is distinct from other pituitary principles. Among the methods of preparation of this principle, those of Janssen and Loeser[21] and of Collip[22] deserve special mention. The injection of certain pituitary extracts will also prevent atrophy of the adrenal glands after hypophysectomy in rats and will cause their enlargement in normal animals (guinea-pigs). The action of these extracts has been shown to be a direct one; it does not occur through the intermediation of the thyroid, since these preparations do not raise the basal metabolism or prevent thyroid atrophy in hypophysectomized rats.[23] Adrenal enlargement may also be induced indirectly through the stimulation of the thyroids, as shown by Loeser.[24] The adrenotropic hormone is ultrafiltrable.[25]

In 1928 and later, Stricker and Grueter,[26] and in 1930 Corner,[27] reported that lactation was induced by the administration of an anterior pituitary extract. This was not due to a contraction of smooth muscle of the gland, such as had been reported earlier from posterior lobe extracts. Following this basic discovery of Stricker and Grueter and of Corner, others have studied the reaction more in detail (Asdell,[28] Gardner and Turner,[29] Nelson and Pfiffner,[30] Riddle and his associates[31] and others). Both Turner and Riddle have worked intensively on this principle, which they respectively have designated as galactin and prolactin. Prolactin or galactin does not cause the development of the mammary gland, this being induced by secretions of the ovary, but it does cause the onset and continuation of the secretory phase. That this is the pituitary galactogogue principle solely responsible for the initiation of lactation is made doubtful by the finding of Selye and his associates[32] that lactation, though brief in duration, will take place at parturition in rats that have been hypophysectomized for some days. That the pituitary secretes a hormone either directly or indirectly essential for the continuance of lactation seems established.

One of the questions concerning pituitary physiology which appears to be nearing solution is that in regard to the number of gonad-stimulating hormones. The Wisconsin group (Hisaw and Fevold and their collaborators[33]) in a long continued series of investigations has presented increasingly convincing evidence that the anterior hypophysis secretes two gonadotropic hormones. Supporting evidence has recently also been published from other laboratories. In this work the female has been used largely and this has led to the designation of the two hormones as follicle-stimulating and luteinizing, respectively. These designations, although justifiable at the present state of knowledge, will undoubtedly prove unsatisfactory later, for it is highly probable that if the pituitary secretes two gonad-stimulating fractions in the female, it does so also in the male. As in the female, there are in the male two types of gonad tissue. In the male, both these types atrophy after hypophysectomy. Evidence will be presented in a later section which shows that the two types of testicular tissue are stimulated by separate hormones. Although investigators have been slow, largely because of the absence of conclusive evidence in its support, to accept the hypothesis of two pituitary gonadotropic principles, the present evidence indicates that there are two such hormones.

The problem of the unity or duality of the pituitary gonad-stimulating hormones not only is of importance in studies on the physiology of the pituitary but its solution may also give information that will assist in solving the problem of the origin of the gonadotropic principles found in the blood and urine. It is now known that the gonadotropic principle present in the urine (or blood) during pregnancy is different from that present after ovariectomy (or the menopause). They elicit very different reactions when injected into normal rodents,[34] hypophysectomized female rats[35] or hypophysectomized male rats.[36] Pregnancy urine extracts do not cause follicular growth in normal monkeys[37] or hypophysectomized rats (Leonard and Smith,[38] Collip and his associates[39]), whereas extracts of urine of women after ovariectomy or the menopause cause marked follicular growth in both these forms. The latter substance appears to give an almost pure gametokinetic action (follicular granulosa and seminiferous epithelium stimulation), whereas extracts of human pregnancy urine stimulate largely the connective tissue derivatives (theca and interstitial cells of the ovary and the interstitial cells of the testes). That pregnancy urine extracts also induce luteinization of the granulosa of the follicle and stimulate the seminiferous epithelium seems established from the work of Smith and Leonard,[40] although evidence on this point is not harmonious (Collip[39]). Since extracts of urine of castrates give reactions which are nearly identical with

21. Janssen, S., and Loeser, A.: Die Wirkung des Hypophysenvorderlappens auf die Schilddrüse, Arch. f. exper. Path. u. Pharmakol. **163:** 517, 1931.

22. Collip, J. B.: Some Recent Advances in the Physiology of the Anterior Pituitary, J. Mount Sinai Hosp. **1:** 28 (May-June) 1934.

23. Collip, J. B.; Anderson, E. M., and Thomson, D. L.: The Adrenotropic Hormone of the Anterior Pituitary Lobe, Lancet **2:** 347 (Aug. 12) 1933.

24. Loeser, Arnold: Hypophysenvorderlappen und Schilddrüse, Arch. f. exper. Path. u. Pharmakol. **173:** 62, 1933.

25. Anselmino, K. J.; Hoffmann, F., and Herold, L.: Ueber das Corticotrope Hormone des Hypophysen Vorderlappen, Klin. Wchnschr. **13:** 209 (Feb. 10) 1934.

26. Grueter, F., and Stricker, P.: Ueber die Wirkung eines Hypophysenvorderlappenhormones auf die Auslösung der Milchsekretion, Klin. Wchnschr. **8:** 2322 (Dec. 10) 1929.

27. Corner, G.: The Hormonal Control of Lactation, Am. J. Physiol. **95:** 43 (Oct.) 1930.

28. Asdell, S. A.: Recent Developments in the Field of Sex Hormones, Cornell Vet. **21:** 147, 1931.

29. Gardner, W. U., and Turner, C. W.: The Function, Assay and Preparation of Galactin, a Lactation Stimulating Hormone of the Anterior Pituitary, Missouri Agric. Sta. Res. Bull. 196, 1933.

30. Nelson, W. O., and Pfiffner, J. J.: Studies on the Physiology of Lactation, Anat. Rec. **51:** 51 (Nov. 25) 1931.

31. Riddle, Oscar; Bates, R. W., and Dykshorn, S. W.: The Preparation, Identification and Assay of Prolactin—a Hormone of the Anterior Pituitary, Am. J. Physiol. **105:** 191 (July) 1933.

32. Selye, Hans; Collip, J. B., and Thomson, D. L.: Effect of Hypophysectomy upon Pregnancy and Lactation, Proc. Soc. Exper. Biol. & Med. **30:** 589 (Feb.) 1933.

33. Fevold, H. L.; Hisaw, F. L.; Hellbaum, A., and Hertz, R.: Sex Hormones of the Anterior Lobe of the Hypophysis, Am. J. Physiol. **104:** 710 (June) 1933.

34. Hamburger, C.: Gonadotropic Hormones from the Hypophysis and Chorionic Tissue, Acta path. et microbiol. Scandinav., suppl. **17:** 1-184, 1933.

35. Leonard, S. L., and Smith, P. E.: The Hypophyseal-Like Qualities of the Gonadotropic Principle Found in the Urine of Certain Individuals, Am. J. Physiol. **108:** 22 (April) 1934.

36. Smith, P. E.; Engle, E. T., and Tyndale, H. H.: Gametokinetic Action of Extracts of Follicle-Stimulating Urine, Proc. Soc. Exper. Biol. & Med. **31:** 745 (March) 1934.

37. Engle, E. T.: Biological Differences in Response of the Female Macacus Monkey to Extracts of the Anterior Pituitary and of Human Pregnancy Urine, Am. J. Physiol. **106:** 145 (Oct.) 1933.

38. Leonard, S. L., and Smith, P. E.: Responses of the Reproductive System of Hypophysectomized Rats to Injections of Pregnancy-Urine Extracts: II. The Female, Anat. Rec. **58:** 175 (Jan. 25) 1934.

39. Selye, Hans; Collip, J. B., and Thomson, D. L.: On the Effect of the Anterior Pituitary-Like Hormone on the Ovary of Hypophysectomized Rat, Endocrinology **17:** 494 (Sept.-Oct.) 1933. Collip, J. B.; Selye, Hans, and Thomson, D. L.: Beiträge zur Kenntnis der Physiologie des Gehirnanhanges, Virchows Arch. f. path. Anat. **290:** 23, 1933.

40. Smith, P. E., and Leonard, S. L.: Responses of the Reproductive System of Hypophysectomized and Normal Rats to Injections of Pregnancy-Urine Extracts: I. The Male, Anat. Rec. **58:** 145 (Jan. 25) 1934.

the purest follicle-stimulating pituitary extracts so far prepared, it seems justifiable to assume that this principle is of pituitary origin. Solution of the problem of whether or not pregnancy urine also contains a gonadotropic principle which is secreted by the anterior pituitary must await fractionation of this principle and comparison of the action of the fractions with physiologically pure gonadotropic extracts made from the pituitary. The problem of the origin of the urinary gonadotropic principles is thus closely related to the problem of the unity or duality of the pituitary gonad-stimulating hormones. This same dependence may be found in studies on the gonad-stimulating principle found in the urine of women (and probably of men also) during the sexually active period of life.

Mention should be made of three other responses that are elicited by injections of anterior pituitary extracts. One of these is the effect on the parathyroid. Little work has as yet been done on the parathyrotropic principle obtained from the pituitary. A pronounced hypertrophy has been reported from its injection.[41] As in the case of the response of the thyroid to injections of the thyrotropic hormone, long continued injections do not maintain the hypertrophy of the parathyroids.

Another action of the pituitary is that on carbohydrate metabolism. In 1930 Houssay and Biasotti [42] reported that symptoms of diabetes in dogs after pancreatectomy were either cured or alleviated by subsequent hypophysectomy, a finding also reported by Barnes and Regan.[43] These results thus extend the observation of Cushing and his associates [44] that hypophysectomy increased the sugar tolerance. The results are harmonious with and explainable by the discovery that hypophysectomy lowers the blood sugar (D'Amour and Keller,[45] White [46]), an effect that has been designated as "hypoglycemia hypophysiopriva." [47] Hypophysectomy is known to increase insulin sensitivity. The further finding that prolonged injections of anterior pituitary extracts (growth hormone, Evans) produce glycosuria in normal dogs, a finding which was reported by Borchardt in 1908 in rabbits, is in agreement with these observations and with the frequent occurrence of glycosuria in acromegaly. Anselmino and Hoffmann [48] have described a pancreatropic hormone from the anterior pituitary which induces hypertrophy of the pancreatic islands and hypoglycemia.

A more obscure pituitary effect is that on fat metabolism, for which a separate hormone has also been postulated by Anselmino and Hoffmann.

From this brief summary it is evident that no less than six and possibly eight hormones have been extracted from the anterior pituitary. That this small gland, which in man averages less than 0.5 Gm. in weight, secretes this number of hormones as separate entities throughout the entire secretory process taxes the imagination. Numerous contributions to the cytology of the normal gland and of cases of tumor formation show that there are but two secretory types of cells—the basophils and the acidophils. The third type, chromophobes, appears to be not an active secretory cell but a reserve type. This differentiation of two highly specialized secretory types of cells in the pituitary suggests perhaps the formation of a corresponding number of basic secretory products, which may be altered to give these specific responses. The chemical interrelationship of pituitary hormones holds an interest equal to that of their physiologic interrelationships.

The present anterior pituitary products are almost without exception extremely crude from a chemical point of view and usually are impure, physiologically. There will be no certainty until physiologically pure extracts are secured as to how much these impurities may modify the responses. The present purified products (for example, purified growth hormone) are purified only in contrast to the earlier souplike preparations. An instructive example of how impure products may lead to erroneous conclusions is afforded by physiologic work on pregnancy urine extracts. In nearly all earlier work with this material, injurious effects on the tubules of the testes were reported. The more concentrated and purified products now available, however, show that even with high dosages there is no injury but probably a stimulating effect on the tubules. To what extent further purification and fractionation of the material will further modify the reactions cannot now be predicted. The realization that conclusive determination of the responses elicited by the various hormones must await the securing of uncontaminated principles does not mean, however, that present studies with cruder products are valueless or should be discontinued. Such studies are essential to progress in purification, for in no other way can the chemist know whether his more or less mutilating procedures are destroying or modifying activity.

ANTIHORMONES

The failure of animals to continue to respond when chronic treatments with certain of the pituitary extracts are given has led to the formulation of a theory that antihormones are formed (Collip [22]). A number of investigators have reported that thyroid stimulation is not maintained with continued administration of the thyrotropic hormone (Siebert and Smith,[49] Friedgood,[50] Collip [22]). A maximum response varying from the fourth to the twelfth or fourteenth day is followed by a depression that may carry the basal metabolism below the normal level, a terminal effect clearly shown by Lee, Teel and Gagnon [51] several years ago. As stated earlier in this paper, the parathyroid hypertrophy from administration of the parathyrotropic hormone also does not persist with continued treatment. There is also a regression in the response of the gonads to pregnancy urine extracts. Collip [22] has presented growth curves of hypophysectomized rats showing an abrupt cessation in growth and a subsequent loss in weight after about thirty days with continued treatment with his preparation of the growth hormone. This

41. Anselmino, K. J.; Hoffmann, F., and Herold, L.: Ueber die Parathyreotrope Wirkung von Hypophysenvorderlappenextrakten, Klin. Wchnschr. **13:** 45 (Jan. 13) 1934.
42. Houssay, A. B., and Biasotti, A.: The Hypophysis, Carbohydrate Metabolism and Diabetes, Endocrinology **15:** 511 (Nov.-Dec.) 1931.
43. Barnes, B. O., and Regan, J. F.: The Relation of the Anterior Pituitary to Carbohydrate Metabolism, Endocrinology **17:** 522 (Sept.-Oct.) 1933.
44. Goetsch, E.; Cushing, Harvey, and Jacobson, C.: Carbohydrate Tolerance and the Posterior Lobe of the Hypophysis Cerebri, Bull. Johns Hopkins Hosp. **22:** 165, 1911.
45. D'Amour, M. C., and Keller, A. D.: Blood Sugar Studies Following Hypophysectomy and Experimental Lesions of the Hypothalamus, Proc. Soc. Exper. Biol. & Med. **30:** 1175 (June) 1933.
46. White, W. E.: The Effect of Hypophysectomy of the Rabbit, Proc. Roy. Soc., London, s. B **114:** 64 (Nov. 1) 1933.
47. Mahoney, W.: Hypoglycemia Hypophysiopriva, Am. J. Physiol. **109:** 475 (Sept.) 1934.
48. Anselmino, K. J., and Hoffmann, F.: Die Pankreatrope substanz aus dem Hypophysenvorderlappen: I. Klin. Wchnschr. **12:** 1435 (Sept. 16) 1933. The work on the pituitary-pancreas interrelationship has recently been extensively reviewed by Lucke: Ergebn. d. inn. Med. u. Kinderh. **46:** 94, 1934.
49. Siebert, W. J., and Smith, R. S.: The Effect of Various Anterior Pituitary Preparations upon Basal Metabolism in Partially Thyroidectomized and Incompletely Thyroidectomized Guinea-Pigs, Am. J. Physiol. **95:** 396 (Nov.) 1930.
50. Friedgood, H. B.: Experimental Exophthalmos and Hyperthyroidism in Guinea-Pigs, Bull. Johns Hopkins Hosp. **54:** 48 (Jan.) 1934.
51. Lee, M. O.; Teel, H. M., and Gagnon, Jules: Basal Metabolism in Giant Rats, Proc. Soc. Exper. Biol. & Med. **27:** 23 (Oct.) 1929.

cessation of response with continued injections of these extracts he attributes to the formation of antihormones. In support of his hypothesis he presents evidence showing the production of an antithyrotropic substance in the blood of the rabbit, goat and horse. He advances the interesting hypothesis that the production of antihormones may be responsible in certain cases for hypoglandular states. The hypothesis is attractive and has aroused considerable interest.

The evidence on the production of antihormones is not entirely harmonious in regard to the effects of prolonged treatments, especially with growth-stimulating pituitary extracts. In chronic treatments of hypophysectomized rats with growth hormone, prepared from pituitaries of the ox, Evans and his associates [1] report a continued gain in weight for the 120 days of treatment, although there was a slowing down in growth late in the experiment. They do not report, as do the Toronto investigators, a regression following the first month of treatment. I [5] showed that daily implants of rat pituitaries for seventy days in a young male hypophysectomized rat gave skeletal growth and an increase in weight throughout this period. The results both of Evans and his associates with growth hormone injections and of Smith with implants thus differ from those of Collip as regards the continuance of growth with prolonged treatment. The blood of diabetic patients even though they display some insulin resistance has no greater power to destroy insulin than has blood from normal individuals,[52] so there is not an antihormone formed in these treatments. It is well known that thyroid administration is effective even when continued for many years.

Loeb [53] has reported that the increased mitosis and the hypertrophy which he found in the thyroid on administration of potassium iodide cease after a time, and the gland then returns to a normal condition even though treatments are continued, as is the case with the administration of anterior pituitary gland extracts. He suggests that one of the reasons for the return to normal conditions may be the increase in the amount of circulating thyroid hormone. He also suggests that the neutralizing substances may arise from a protein from which the thyrotropic hormone has not been separated. It may be significant that the hypophyseal extracts which have been used have been prepared from animals of one species—the ox—and that these extracts are not protein free. There is thus the possibility that the cessation of stimulation and subsequent regression is due to a linkage of the hormone to proteins with the consequent production of antibodies which might not be produced by crystalline hormones. No one has as yet reported whether the action of an extract from donors of one species, such as the hog, sheep or horse, would be prevented by the previous injection of a similar extract from another species. The hypothesis of antihormone production is interesting, but it must be attacked from many angles before the transitory effects from the injection of extracts can be definitely referred to a true antihormone production.

SPECIES AND SEX VARIABILITY

Studies on the pituitary have brought out that there is a species and sex variability in the pituitary content of at least certain of the pituitary hormones and also that there is a species variability in response to these hormones. This variability is of importance both in the selection of donors of pituitary glands from which to prepare extracts and in the selection of recipients used in the testing of the extracts. The pituitaries of beef appear to be richer in growth hormone than those of sheep. The reverse is the case in the gonad-stimulating hormones as attested by the general use of sheep pituitaries in the preparation of gonadotropic preparations. The pituitaries of horses (in pregnancy at least [1]) are richer in gonadotropic principle than those of sheep. The human pituitary is especially rich in the gonadotropic principle.[54] The pituitaries of fowls, on the other hand, are extremely low in content of gonad-stimulating hormone, as shown by the rabbit ovulation test.

A sex difference in the pituitary content of gonadotropic hormone has been found in adults of all species thus far tested, the pituitaries of males being more potent than those of females. Clark [55] has found that this does not hold for prepuberal ages in rats, in which the pituitary of females is more potent than that of males. Although no explanation is available for the species difference in pituitary potency, the sex difference, from the work of Clark, can be explained in part at least by the suppressing action of the gonad hormones on the pituitary, for in rats the hormone of the male gonad is secreted at an earlier age than is that of the female. When the secretion of these hormones is prevented by castration at birth, the pituitaries of the two sexes are equal in potency during the age periods covered by Clark's experiments (puberal and prepuberal ages). It would be of interest to determine whether sex differences in the pituitary content of gonad-stimulating hormone in the adult are entirely referable to a differential secretory rate of the gonads and a consequent differential suppression of the pituitary.

A species difference in sensitivity to injected extracts is established. Evans and his associates [1] have shown that, whereas one strain of dogs, the dachshund, gives a marked response to injections of growth hormone, another strain, the shepherd, fails to give any response whatever to comparable dosages. The refractoriness of the thyroid of rats as regards a structural response to thyrotropic hormone has been the cause of much lost labor in testing for this principle. The sensitivity of the thyroids of fowls, ducks, rabbits and guinea-pigs, on the other hand, make these forms of value in tests for this factor. The situation as regards the gonadotropic hormones is even more complex, for there is both a quantitative and a qualitative difference in the responses of different species. Mice are much more sensitive to the follicle-stimulating fraction than are rats, whereas rats give a greater response to pregnancy urine extract than do mice, although they are much heavier. Qualitative differences in the response of different species to gonadotropic hormones may be very pronounced. The best example to my knowledge is the difference in response of rats or mice and of monkeys to injections of the gonadotropic principle in pregnancy urine. The ovaries of the former, as demonstrated by the usual Aschheim-Zondek test, show follicle growth as well as hemorrhagic follicles and corpora formation.

52. Black, P. T.: The Inactivation of Insulin by Normal and Diabetic Blood, Brit. J. Exper. Path. **14**: 318 (Oct.) 1933.

53. Loeb, Leo: Mechanisms in the Development of an Active Resistance to the Effects of Substances Stimulating the Thyroid Gland in the Guinea-Pig, Science **80**: 252 (Sept. 14) 1934.

54. Leonard, S. L.: A Study of the Pituitary Factor Increasing the Ovarian Weights of Immature Rats When Injected in Combination with Pregnancy Urine, Am. J. Physiol. **108**: 331 (May) 1934.

55. Clark, H. M.: A Prepuberal Reversal of the Sex Differences in the Gonadotropic Hormone Content of the Pituitary Gland of the Rat, Anat. Rec. **61**: 193 (Jan.) 1935.

The ovaries of monkeys injected with this principle, on the other hand, show no follicle growth whatever.[57] There is a hyalinization of the monkey ovaries, and, in contrast to the reaction in rats and mice, no stimulation of secretion of estrogenic substance occurs. The reason for the differences in ovarian responses is unknown. It may be due to the end organ (ovary) or to the amount of circulating pituitary hormone; the phenomenon of "activation"[58] or "augmentation" (Leonard,[54] Fevold, Hisaw and their associates[57]) may play a part. Human ovaries, judging from the work of Geist,[58] appear to react as those of monkeys to injection of pregnancy urine extract. As shown in another section, the ovaries of all these species react in a nearly identical way to pituitary follicle-stimulating hormone.

It is evident that the response elicited by injections of the pituitary or any other hormone is dependent on at least two factors; namely, the stimulating capacity or potency of the dosage given and the responsive capacity of the receptor tissues or organs. A diminution or increase in either of these factors will alter the effect. In work on the pituitary gland the potency of extracts has been given a more prominent place than has the responsive capacity of the receptor, though current literature indicates that the importance of the latter is being realized more and more. General credence was earlier given to the view so ably sponsored by Keith and others that racial size, for instance, was referable to the secretory activity of the pituitary. It is not to be denied that the secretory rate of the endocrines may be influenced by heredity and even that this influence may be so profound as to cause an entire failure in the production of a secretion, as in the case of growth hormone in the dwarf mouse.[59] That this is not the main or even a significant cause of racial skeletal peculiarities, however, is being shown by the very instructive interbreeding of different strains of dogs[60] and by the work of the experimental embryologists on the experimental transplantation of limbs or organs (Harrison[61] and others). In these experiments it has been shown that, under the same endocrine environment, limbs or other structures from two species of different sizes will respond differentially because of their inherited growth capacity.

The response is influenced not only by the genetic constitution but by other factors, prominent among which is the aging process. The importance of the latter is well exemplified by the ovary. It has been shown experimentally that prior to a certain age level the follicles are incapable of responding to injections of the follicle-stimulating hormone, although the follicles may be of considerable size.[62] From conditions found in women it may be surmised that after a certain degree of aging the reproductive organs lose their capacity to respond, for, after the menopause, follicle-stimulating hormone may be present in large amounts yet reproductive cycles cease.

It was stated at the beginning of this article that the problem of the physiology of the pituitary gland has become more complex rather than simplified by investigations reported in the last few years. The validity of this statement is attested by the fact that there are now an increased number of hormones the interrelationships of which functionally and chemically have hardly been explored at all and by the fact that there has been shown to be a differential capacity of response in various species and even in the same species at different age levels.

56. Evans, H. M.; Meyer, K., and Simpson, M. E.: Relation of Prolan to the Anterior Hypophyseal Hormones, Am. J. Physiol. **100:** 141 (March) 1932.

57. Fevold, H. L.; Hisaw, F. L.; Hellbaum, A., and Hertz, R.: Anterior Lobe or Anterior Lobe-like Sex Hormone Combinations on Growth of Ovaries of Immature Rats, Proc. Soc. Exper. Biol. & Med. **30:** 914 (April) 1933.

58. Geist, S. H.: Reaction of the Mature Human Ovary to Antuitrin S, Am. J. Obst. & Gynec. **26:** 588 (Oct.) 1933.

59. Smith, P. E., and MacDowell, E. C.: The Differential Effect of Hereditary Mouse Dwarfism on the Anterior Pituitary Hormones, Anat. Rec. **50:** 85 (July 25) 1931.

60. Stockard, C. R.: Gene Constitution and Endocrine Quality in Determining Growth Reactions, Proceedings of the National Academy of Science, Science **77:** 518, 1933; Genetic Constitution and Endocrine Environment in Structural Expression, Anat. Rec. **55:** 38 (supp. No. 4) 1933.

61. Harrison, R. G.: Harvey Lecture 1934, to be published.

62. Smith, P. E.; Engle, E. T., and Tyndale, H. H.: Differential Ovarian Responses After Injections of Follicle-Stimulating and Pregnancy Urine in Very Young Female Rats, Proc. Soc. Exper. Biol. & Med. **31:** 744 (March) 1934.

THE HYPOPHYSEAL GONADOTROPIC HORMONES

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The discovery in 1926-1927 that the anterior pituitary gland secreted a substance essential to the functioning of the gonads has been followed by many investigations, which have greatly extended the knowledge of the pituitary-gonad interrelationship.

I do not wish to give the impression that important work in this field had not been done prior to 1926-1927. The observations published here and abroad at that time were only a final demonstration of the important rôle played by the anterior hypophysis in reproduction. More than twenty years ago Cushing and his co-workers [1] and Aschner [2] had demonstrated that hypophysectomy caused an atrophy of the reproductive system. By partial gonadectomies, parabioses and the like it had also been shown that some extragonadal factor was essential to gonadal function. Evans and Long [3] had secured excessive luteinization of the ovaries in normal rats by the injection of anterior lobe extracts. In 1927 restoration of gonadal function after hypophysectomy with hypophyseal implants [4] and induction of precocious sexual maturity with the same treatment (Aschheim,[5] Smith,[6] Smith and Engle [7]) conclusively demonstrated that the anterior lobe maintained and controlled the activity of the ovaries and testes and through them influenced the other reproductive organs.

Although the extracts thus far prepared do not have the desired physiologic purity, evidence gained from their use in the laboratory strongly indicates that two types of preparations can be made. One of these, in the terminology of the response in the female, gives follicular stimulation. The other fraction, the purification of which has not progressed as far as the purification of the follicle stimulator, gives luteinization. As regards the sexes, the former stimulates primarily the germ cell line (male germ cells, ova and granulosa),

1. Crowe, S. J.; Cushing, Harvey, and Homans, J.: Experimental Hypophysectomy, Bull. Johns Hopkins Hosp. **21:** 127, 1910.

2. Aschner, B.: Ueber die Beziehungen zwischen Hypophysis und Genitale, Arch. f. Gynäk. **97:** 200, 1912.

3. Evans, H. M., and Long, J. A.: Characteristic Effects upon Growth, Oestrus and Ovulation Induced by the Intraperitoneal Administration of Fresh Anterior Hypophyseal Substance, Proc. Nat. Acad. Sc. **8:** 38, 1922.

4. Smith, P. E.: The Disabilities Caused by Hypophysectomy and Their Repair, J. A. M. A. **88:** 158 (Jan. 15) 1927.

5. Aschheim, Selmar: Ueber die Funktion des Ovariums, Ztschr. f. Geburtsh. u. Gynäk. **90:** 387, 1926.

6. Smith, P. E.: Hastening Development of Female Genital System by Daily Homoplastic Pituitary Transplants, Proc. Soc. Exper. Biol. & Med. **24:** 131 (Nov.) 1926.

7. Smith, P. E., and Engle, E. T.: Experimental Evidence Regarding the Rôle of the Anterior Pituitary in the Development and Regulation of the Genital System, Am. J. Anat. **40:** 159 (Nov.) 1927.

and is therefore gametokinetic or gametogenic in its action. The latter, the luteinizer, theoretically should and actually appears to act predominantly on the connective tissue derivatives (the theca cells of the ovaries and the interstitial cells of the testis). In addition to this progress on the fractionation of the hypophyseal gonad-stimulating hormones, gonadotropic substances have been discovered in human blood and urine during pregnancy, after ovariectomy and the menopause, in certain tumors of the reproductive organs, and, in smaller amounts, in the blood and urine of men and women during the normal reproductive period. A gonadotropic substance is present in large amounts in the blood serum of mares during approximately the middle third of pregnancy and, in small quantities, in the blood of certain lower forms after castration. Although this paper deals primarily with the pituitary hormones, it will be advisable also to discuss briefly the action of the gonad-stimulating principles in the blood and urine. It seems clear that certain of the latter are actually secreted by the anterior lobe, and, although the origin of others is problematic, nevertheless a statement of their action is of value in a discussion of the gonadotropic hormones known to be of pituitary origin.

"FOLLICLE-STIMULATING" AND "LUTEINIZING" HORMONES OF THE HYPOPHYSIS

Work on the fractionation of the gonad-stimulating factor of the anterior pituitary has been vigorously carried on for a number of years by Fevold, Hisaw and their collaborators.[8] More recently, Wallen-Lawrence [9] and Evans and his co-workers [10] have reported extracts secured by other methods of fractionation. Hisaw and Fevold have secured a fraction which in female hypophysectomized rats, in young rabbits, or, with limited treatment, in immature rats, gives pure follicle growth.[11] In the latter form, corpus luteum formation will take place after several days of treatment, a result undoubtedly due to the secretion of the animal's own pituitary gland. The effects from the injection of their follicle-stimulating fraction in hypophysectomized females are identical with those secured by the injection of extracts of the urine of postmenopause or ovariectomized women (Leonard and Smith [12]). In normal immature rats or mice this urinary principle gives also follicular growth (Hamburger [13]), which may be followed by corpus luteum formation. In immature monkeys both the anterior hypophyseal follicle-stimulating fraction and the extracts of urine of castration give pure follicular growth.[14] Thus the principle in castrate or menopause urine seems to be identical with the follicle-stimulating fraction prepared from pituitary glands.[15] The gonadotropic principle in pituitaries of horses that have long been castrated also consists largely or entirely of the follicle-stimulating fraction (Hellbaum [16]).

A noteworthy feature in treatments of rodents or monkeys with the follicle-stimulating fraction (from castrate urine and probably from the hypophysis also) is the absence of cyst formation in the ovaries, even with large doses (Smith and Engle [17]). The injection of unfractionated extracts of the hypophysis (from the sheep) or implants, on the other hand, cause frequently the formation of large cysts in these animals. From these experimental results the clinical use of a purified follicle-stimulating extract will presumably be attended with much less danger of cyst production than will use of unfractionated gonadotropic hypophyseal extracts.

The action of the castrate-urine follicle-stimulating principle in hypophysectomized males is of great interest. The seminiferous epithelium of the atrophied testes of such animals shows a profound response, spermatids and even spermatozoa being produced with a slight or no response of the interstitial tissue, as revealed both by structural studies and by a failure of the accessory reproductive organs to hypertrophy (Smith and Engle [18]). Evans and Simpson [10] have recently reported a similar effect from a principle secured by fractionating the hypophysis. Their extract thus also acts as does the principle in castrate urine.

The evidence therefore rather convincingly shows that a fraction can be extracted from the anterior lobe which appears to be physiologically identical with that in castrate urine and which stimulates in both sexes predominatingly the germ cells (and tissues having the same origin, as the granulosa of the ovarian follicle). This principle therefore could well be designated as a gametokinetic principle.

The present status of a "luteinizing" gonadotropic hormone as I see it is not as definite as that of the gametokinetic fraction.

Fevold and his associates [8] and Wallen-Lawrence [9] have reported a fraction from the anterior lobe which, when injected alone, will cause but a slight or no increase in ovarian weight and will produce no luteinization unless large follicles are present. If injected with a "follicle-stimulating" fraction, the follicles that have been stimulated to growth by the latter will then become luteinized. In my opinion, adequate tests have not been reported with this material in hypophysectomized animals in which any confusion due to the secretion of the animal's own hypophysis is eliminated.

In many respects the gonadotropic principle in human pregnancy urine meets most of the requirements that it seems justifiable to postulate for a "luteinizing" principle. This is stated without prejudicing the question of the site of formation of this principle, conclusive data on which are not yet available. Extracts of pregnancy urine, as has been repeatedly demonstrated, will not cause follicle growth when injected into hypophysectomized rats (Selye and his collaborators,[19] Leonard and Smith,[20] and others). It produces a

8. Fevold, H. L.; Hisaw, F. L.; Hellbaum, A., and Hertz, R.: Sex Hormones of the Anterior Lobe of the Hypophysis, Am. J. Physiol. **104:** 710 (June) 1933.

9. Wallen-Lawrence, Z.: Proof of the Existence of a Follicle Stimulating and a Luteinizing Hormone in the Anterior Lobe of the Pituitary Body, J. Pharmacol. & Exper. Therap. **51:** 263 (July) 1934.

10. Evans, H. M.; Pencharz, R. I., and Simpson, Miriam, E.: On a Selective Gametogenic Effect of Certain Hypophyseal Extracts, Science **80:** 144 (Aug. 10) 1934.

11. Through the courtesy of Dr. Hisaw I have repeatedly injected this fraction into hypophysectomized rats with the effect stated above.

12. Leonard, S. L., and Smith, P. E.: The Hypophyseal-Like Qualities of the Gonadotropic Principle Found in the Urine of Certain Individuals, Am. J. Physiol. **108:** 22 (April) 1934.

13. Hamburger, C.: Studies on Gonadotropic Hormones from the Hypophysis and Chorionic Tissue, Acta path. et microbiol. Scandinav., 1933, supp. 17, pp. 1-184.

14. Engle, E. T.: Unpublished experiments.

15. H. C. A. Lassen, and E. Brandstrup (Acta obst. et gynec. Scandinav. **14:** 89, 1934) report that women castrated surgically or by x-rays excrete both a follicle stimulator (prolan A) and a luteinizer (prolan B), the proportions of which vary. In this work normal rodents were used in determining the proportions. Although hypophysectomized rats would seem to be a much more reliable test form, nevertheless their observations are significant and call attention to the need of making further analyses.

16. Hellbaum, A. A.: Gonadotropic Activity of the Pituitaries of Horses, Proc. Soc. Exper. Biol. & Med. **30:** 641 (Feb.) 1933.

17. Smith, P. E., and Engle, E. T.: Gonad-Stimulating Hormones from the Pituitary and from Human Urine, J. Pediat. **5:** 163 (Aug.) 1934.

18. Smith and Engle.[17] Smith, P. E.; Engle, E. T., and Tyndale, H. H.: Gametokinetic Action of Extracts of Follicle-Stimulating Urine, Proc. Soc. Exper. Biol. & Med. **31:** 745 (March) 1934.

19. Selye, Hans; Collip, J. P., and Thomson, D. L.: On the Effect of the Anterior Pituitary-Like Hormone on the Ovary of Hypophysectomized Rats, Endocrinology **17:** 494 (Sept.-Oct.) 1933.

20. Leonard, S. L., and Smith, P. E.: Responses of the Reproductive System of Hypophysectomized Rats to Injections of Pregnancy Urine Extracts: II. The Female, Anat. Rec. **58:** 175 (Jan. 25) 1934.

pronounced luteoid change of the theca cells of the follicle and, according to the results of Leonard and Smith, true corpus luteum formation also if follicles of a size sufficient to be acted on are present. When injected subsequent to the follicle stimulation fraction in hypophysectomized female rats it produces luteinization and "augmentation" (see next section). In males, whether normal or hypophysectomized, it produces an extensive interstitial tissue hypertrophy. However, it also stimulates the seminiferous epithelium (Smith and Leonard [21]), an effect which, although repeatedly denied by Collip,[22] has been confirmed recently by Evans and his associates [23] and which is supported also by the work of Brosius and Schaefer [24] in cases of aspermia in man. This action on the seminiferous epithelium may be due to a gametokinetic fraction in pregnancy urine, the action of which is masked in hypophysectomized females by the "luteinizing" fraction. In monkeys in which it seems difficult to secure luteinization the pregnancy urine extracts alone hyalinize the ovary, and such appears to be the case also in women (Geist [25]). In combinations with hypophyseal gonadotropic extracts it may cause luteinization in monkeys (Engle [26]); Westman [27] reports corpus luteum formation in a woman after the menopause who was given a transfusion of blood from a pregnant woman.

OTHER SUGGESTED PRINCIPLES OF THE ANTERIOR PITUITARY

Mention should be made of two other gonadotropic hormones that some work has suggested.

"Ovulation Hormone."—Mention of the possibility of an ovulation hormone appears not infrequently in the literature, though in my opinion the evidence does not indicate the formation of such a hormone. Although in some nonspontaneously ovulating forms (rabbit, ferret) ovulation can be induced during their extensive periods by injection of most anterior lobe extracts, in other forms the induction of ovulation is accomplished with difficulty. In hypophysectomized rats many follicles can be brought to a mature size only to regress and be replaced by others by the daily administration of a gametokinetic (follicle-stimulating) pituitary extract. Ovulation will not take place apparently until a luteinizing extract is injected. Many failures have resulted in experimental attempts to secure ovulation in monkeys whose follicles have been matured by the injection of a follicle-stimulating extract. Recently this has been achieved by Hisaw and his group, by correctly balancing the amounts of follicle-stimulating and luteinizing extracts that were injected.[28] An excessive number of eggs were secured. Ovulation appears not to be due to a specific principle but to the concurrent action of these two fractions at a correct stage of follicular development.[29]

"Synergistic" Principle.—It has been demonstrated that the concurrent administration of a low dosage of gonad-stimulating fraction and of a pregnancy urine extract gives an ovarian response in rats much greater than would be predicted from the sum of the responses of the two substances acting alone. This has been characterized as "activation" by Evans and as "augmentation" by Hisaw and his co-workers. Its explanation has caused the introduction into the literature by Evans and his associates of the term "synergistic principle" in a way which indicates that it is considered as a separate hormone (Evans and his associates [30]). It has been demonstrated that "augmentation" with pregnancy urine extracts and anterior pituitary extracts takes place only when the latter contains a gonad-stimulating principle.[31] It will also take place when two pituitary gonadotropic principles, one causing predominantly luteinization and the other follicle growth, are concurrently injected. The assumption of a separate "synergistic" principle to explain the augmented response seems unnecessary. It seems to be adequately explained by the assumption that the follicle will pass through full development to corpus luteum formation only when acted on by a "luteinizer" in addition to a "follicle stimulator." The former, when acting alone, may give no increase in ovarian weight but, when introduced in the presence of follicles stimulated by the latter, it will cause luteinization, and apparent augmentation will result. Because "augmentation" will occur in the rat, it should not be inferred that it will occur in all other forms.

Pregnancy Mare Serum.—Although but a limited space was allocated for this review of the gonadotropic hormones, the review would seem to be incomplete without at least a short discussion of the gonad-stimulating substance discovered by Cole and Hart [32] in the serum of pregnant mares during the midperiod of pregnancy. This substance is present in large amounts in the serum. No structural description of the effects of the injection of this have been published, though Evans and his co-workers [33] have reported enormous enlargement of the ovaries from its injection in hypophysectomized female rats. It is pertinent to state that the size of the response is no criterion of the effectiveness of a gonadotropic substance in restoring ovarian function. A normal sized gland that is structurally normal is the desideratum. They have reported that it restores the function of the testes after hypophysectomy. This I can confirm. Both the seminiferous tubules and the

21. Smith, P. E., and Leonard, S. L.: Responses of the Reproductive System of Hypophysectomized and Normal Rats to Injections of Pregnancy-Urine Extracts: I. The Male, Anat. Rec. **58:** 145 (Jan. 25) 1934.

22. Collip, J. P.: Some Recent Advances in the Physiology of the Anterior Pituitary, J. Mount Sinai Hosp. **1:** 28, 1934.

23. Evans, H. M.; Pencharz, R. I., and Simpson, Miriam E.: Maintenance and Repair of the Reproductive System of Hypophysectomized Male Rats by Hypophyseal Synergist, Pregnancy Prolan and Combinations Thereof, Endocrinology **18:** 607 (Sept.-Oct.) 1934.

24. Brosius, W. L., and Schaefer, R. L.: Spermatogenesis Following Therapy with the Gonad Stimulating Extract from the Urine of Pregnancy, J. A. M. A. **101:** 1227 (Oct. 14) 1933.

25. Geist, S. H.: Reaction of the Mature Human Ovary to Antuitrin-S, Am. J. Obst. & Gynec. **26:** 588 (Oct.) 1933.

26. Engle, E. T.: Luteinization of the Ovary of the Monkey by Means of Combined Use of Anterior Pituitary Extract and an Extract of Pregnancy Urine, Endocrinology **18:** 513 (July-Aug.) 1934.

27. Westman, A.: Reaktivierung von senilen menschlichen Ovarien, Zentralbl. f. Gynäk. **58:** 1090 (May 12) 1934.

28. Personal communication to the author.

29. It is probably premature and therefore unwise to attempt to correlate these results with the normal cycle. It is tempting to hypothesize on the subject, however. If, in the normal cycle, the follicle-stimulating hormone causes the growth of the follicle, this then being followed by the secretion of the luteinizing hormone which acts in the second part of the cycle, the extra-ovarian factor causing ovulation may well be the balanced action of these two principles in the mid-interval (ovulatory) period.

30. Evans, H. M.; Simpson, Miriam E., and Austin, P. R.: Further Studies on the Hypophyseal Substance Giving Increased Gonadotropic Effects when Combined with Prolan, J. Exper. Med. **58:** 545 (Nov.) 1933. Evans, H. M.; Pencharz, R. I., and Simpson, Miriam E.: The Repair of the Reproductive System of Hypophysectomized Female Rats by Combinations of a Hypophyseal Extract (Synergist) with Pregnancy-Prolan, Endocrinology **18:** 601 (Sept.-Oct.) 1934.

31. The theory of "augmentation" has been critically discussed with the introduction of new pertinent data by Leonard (A Study of the Pituitary Factor Increasing the Ovarian Weights of Immature Rats when Injected in Combination with Pregnancy Urine, Am. J. Physiol. **108:** 331 [May] 1934). Fevold and Hisaw (Interactions of Gonad-Stimulating Hormones in Ovarian Development, ibid. **109:** 655 [Oct.] 1934) and Hamburger.[32]

32. Cole, H. H., and Hart, G. H.: The Potency of Blood Serum of Mares in Progressive Stages of Pregnancy in Effecting the Sexual Maturity of the Immature Rat, Am. J. Physiol. **93:** 57 (May) 1930.

33. Evans, H. M.; Meyer, K., and Simpson, M. E.: The Growth and Gonad-Stimulating Hormones of the Anterior Hypophysis, Memoirs of the University of California **2**, 1933.

interstitial tissue are stimulated and complete restoration of function results. In hypophysectomized (or normal females) it gives both follicular growth and luteinization, thereby explaining the enormous ovaries that can be secured from its administration. These results in both males and females thus indicate that the pregnant mare serum contains some principle in addition to a follicle stimulator. Recent results of Cole and Hart [34] have led them to believe that there are two principles in the serum.

CONCLUSIONS

Work on the gonadotropic substance from the hypophysis and from other sources (from castrate and menopause urine) strongly indicates that the principle commonly designated as the gonad-stimulating principle is composed of two principles. One of these, a gametokinetic (follicle stimulating) principle, has been secured in a fair degree of physiologic purity by fractionation of the anterior hypophysis, and it is also present with little or no contamination with other hormones in the blood and urine after the menopause and ovariectomy. Work with the other principle is somewhat less satisfactory. It appears that the other factor, which may at this time be designated as a "luteinizer," causes luteinization of the ovary. It presumably acts also on the interstitial tissue of the testes. The present indications are that in the therapy of hypogonadism due to a hypophyseal deficiency the administration of one or the other or a proper mixture of these two factors will be required to induce normal gonadal function.

INTERRELATIONSHIPS AMONG URINARY, PITUITARY AND PLACENTAL GONADOTROPIC FACTORS

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The discussion in this article will be confined to the known estrogenic and gonadotropic factors of the pituitary, placenta and urine. A great mass of factual evidence bearing on these active principles has been accumulating within the past few years and indeed is still being added to rapidly month by month. Proved facts must be accepted, but an adequate and totally satisfactory correlation of these facts is quite impossible at this time. I can hope only to present a point of view that seems the most satisfactory explanation of the known facts.

ACTIVE PRINCIPLES

There is a group of estrogenic substances which may be subdivided into those active in castrates and those active only in animals with intact gonads (gonadotropic substances [1]). The latter group may be subdivided into two: those of pituitary origin and those of placental origin. Some or all of these are found to occur in pregnancy blood and urine, the placenta, the ovary and the pituitary. In addition to these, there is in the female the luteal hormone, a product of the ovary; and in the male, the testis hormone, presumably a product of the interstitial cells of the testis. Some conception of the state of confusion in which earlier workers found themselves may be had from the following example: A relatively crude extract of human placenta made by extraction of the fresh material with 50 per cent acetone was found to produce estrus both in castrate rats and in immature rats if administered either by feeding or by injection. The original extract was divided into ether soluble and ether insoluble fractions. The former was effective in the production of estrus either by feeding or by injection, as was the original extract. The ether insoluble fraction, however, had the same properties. It was found that the ether insoluble fraction was more active estrogenically in the intact immature animal than in the adult castrate. The ether insoluble fraction was again divided into two fractions by precipitation with alcohol. Again, both the alcohol soluble and the alcohol insoluble fraction produced estrus when injected into immature rats. The former was effective when fed, but the latter was inert when orally administered. The former was active in large doses in castrates, and the latter was completely ineffective in the absence of the ovaries.

From work of this sort—so confusing at first—with pregnancy urine, blood, placenta and anterior lobe pituitary tissue, carried out by many workers in different laboratories, there emerged facts that allow of classification of the estrogenic substances just mentioned.

ESTROGENIC SUBSTANCES WITHOUT GONADOTROPIC EFFECT

Although different forms of estrogenic substance have been obtained in crystalline form (Thayer, Levin and Doisy,[1a] Butenandt,[2] Marrian [3] and Browne [4]), it is a fact of special significance that the bulk of estrogenic substance in fresh urine occurs in some organic combination, as yet unknown. The estrogenic factor of the placenta also occurs in combination with some organic substance which is particularly resistant to hydrolysis; it is possible to prepare potent, orally active, estrogenic extracts in which the active principles are alcohol soluble but ether insoluble. The active principle in the water soluble, ether insoluble complex can be split off, for the most part, by acid hydrolysis, and then it will pass readily into an organic solvent such as ether, from which it can be purified. Since the ovary contains only a very small amount of estrogenic principle and as placenta, pregnancy blood and urine are rich in estrogenic material, it has been accepted by most workers that the estrus-inducing factor excreted during pregnancy is of placental origin. Although no positive morphologic effect has been produced on the ovary with purified estrogenic preparations (except by administration of large doses over long periods), it is possible that the ovary may have some action on the placental product in the way of converting it into a more active form (Browne [4] and Collip, Browne and Thomson [5]).

34. Cole, H. H., and Hart, G. H.: Concerning Gonadotropic Substances in Mare Serum, Proc. Soc. Exper. Biol. & Med. **32**: 370 (Nov.) 1934.

From the Department of Biochemistry, McGill University.

1. It is necessary that a clear distinction be made between those substances which produce estrus directly (in the absence of the ovaries), which in this series of articles are grouped under the generic title "estrogenic substance" and the gonadotropic principles which produce estrus indirectly by stimulating the production of estrogenic substance by the ovary.—Ed.

1a. Thayer, S. A.; Levin, L., and Doisy, E. A.: The Preparation of Theelol, J. Biol. Chem. **91**: 655-665 (May) 1931; Theelin: Some Physical and Chemical Properties, ibid. **91**: 791-801 (May) 1931.

2. Butenandt, A.: Ueber die Reindarstellung des Follikelhormons aus Schwangerenharn, Ztschr. f. physiol. Chem. **191**: 127-139, 1930; Ueber physikalische und chemische Eigenschaften des krystallisierten Follikelhormons, ibid. **191**: 140-156, 1930.

3. Marrian, G. F.: Chemistry of Oestrin: An Improved Method of Preparation and Isolation of Active Crystalline Material, Biochem. J. **24**: 435-445, 1930.

4. Browne, J. S. L.: The Chemical and Physiological Properties of Crystalline Oestrogenic Hormones, Canad. J. Research **8**: 180-197 (Feb.) 1933.

5. Collip, J. B.: Browne, J. S. L., and Thomson, D. L.: The Chemical Nature of Emmenin, Endocrinology **18**: 71-74 (Jan.-Feb.) 1934.

GONADOTROPIC PRINCIPLES

There have to be considered here:

1. The maturity hormone complex of the anterior lobe.

2. The anterior pituitary-like gonadotropic hormone of placenta, pregnancy blood and urine.

3. An anterior lobe product found in the urine in certain menopausal cases, in the urine of castrates, and occasionally in normal urine.

Since the discovery of the gonad-stimulating factor called "prolan" in pregnancy urine by Aschheim and Zondek,[6] there has been much discussion as to whether this substance is, first, identical with the anterior lobe product, and, secondly, if identical, whether the hormone found in the placenta, blood and urine is produced by the anterior pituitary or is produced also by the placenta. It is not within the scope of this review to discuss at length the various points of view relating to these questions, which have been put forward from time to time by various workers in this field. The results of a long series of experiments on the response of hypophysectomized rats to the anterior pituitary-like gonadotropic factor has established quite conclusively that this substance cannot replace the gonadotropic substance of the anterior pituitary.[7] The ovarian response of hypophysectomized rats treated with the pituitary-like factor together with a small amount of anterior lobe extract was the same as that with anterior pituitary maturity substance alone, when administered in adequate dosage.[8] The recent experiments conducted in our laboratory[9] showing that animals resistant to the pituitary-like principle would respond to anterior pituitary gonadotropic extract and that animals resistant to anterior pituitary gonadotropic principle would respond to the pituitary-like factor have given good ground for the view that the latter is not identical with a constituent of pituitary tissue. Since there is ample evidence to show that the maturity hormone of the anterior pituitary is bipartite, it becomes necessary to contrast the action of the placental hormone, which I believe to be a single entity, with each part of the pituitary maturity complex. This, at the present time, can be done only by indirect methods, but such a study shows that the physiologic effects of the pituitary-like hormone and the luteinizing fraction of the anterior pituitary are very similar, whereas there is no such close relationship between the follicle stimulating fraction of the pituitary and the hypophyseal-like principle.

THE INFLUENCE OF THE GONADOTROPIC HORMONES ON THE OVARY

Differentiation among the various gonadotropic principles obtained from the pituitary gland, the placenta and the urine is not very easy at present. It seems to be well established, however, that the gonadotropic extracts obtainable from the hypophysis have a different physiologic effect from those obtained from pregnancy urine. While the gonadotropic hormone extracted from pituitary tissue produces follicle maturation and corpus luteum formation in the hypophysectomized rat, the anterior pituitary-like hormone extracted from pregnancy urine or human placental tissue produces no follicle maturation and no corpora lutea in the absence of the hypophysis (Collip, Selye and Thomson[10]). These experiments have been confirmed by several investigators, and although Leonard and Smith[11] reported that in some cases small corpora lutea were observed, they agree with us in that the main action of the pituitary-like fraction in the hypophysectomized female is not the luteinization of the granulosa cells but the transformation of theca cells into so-called theca-lutein cells. Further experiments will have to establish whether the occasional luteinization of an immature follicle by the hypophyseal-like gonadotropic fraction, as observed in Smith's laboratory, is really due to this principle itself or to some accompanying substance.

Similarly, in the male hypophysectomized rat, the only effect of the pituitary-like principle that we could observe was an increase in the size and number of interstitial cells; the seminal epithelium has not been affected.[12] While Smith and Leonard[13] and also Evans and his collaborators[14] confirmed our statements concerning the increase in interstitial tissue after the administration of the anterior pituitary-like gonadotropic factor in the hypophysectomized rat, their results differ from ours in that they state that administration of the latter leads to sperm cell formation after hypophysectomy.

From all these experiments it is seen that, while the anterior pituitary-like factor acts first of all on the interstitial cells of both ovary and testis, it has only a limited effect, if any, on the seminal epithelium and on the maturing follicle. The gonadotropic hormone obtained from the pituitary itself acts first of all on the follicle leading to maturation and on the seminal epithelium.

The anterior pituitary-like factor, however, as more recent experiments have shown, is not the only gonadotropic substance obtainable from human urine. It has been proved by Zondek[15] and confirmed by numerous other investigators[16] that the urine of castrates and of women in the menopause may contain the gonadotropic principle which Zondek calls "prolan A" and which has the property of stimulating the growth of the graafian follicle without ever transforming it into

6. Zondek, Bernhard: Die Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenvorderlappenhormons, Klin. Wchnschr. **7**: 1404 (July 22) 1928. Aschheim, Selmar: Die Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenvorderlappenhormons, ibid. **7**: 1453 (July 29) 1928.

7. Selye, Hans; Collip, J. B., and Thomson, D. L.: Effect of Anterior Pituitary-like Hormone on the Ovary of the Hypophysectomized Mouse, Proc. Soc. Exper. Biol. & Med. **31**: 264-265 (Nov.) 1933.

8. Collip, J. B.; Selye, Hans; Thomson, D. L., and Williamson, J. E.: Replacement of Gonadotropic Action of Pituitary in the Hypophysectomized Rat, Proc. Soc. Exper. Biol. & Med. **30**: 665-667 (Feb.) 1933.

9. Selye, Hans; Collip, J. B., and Thomson, D. L.: Loss of Sensitivity to the Anterior Pituitary-Like Hormone of Pregnancy Urine, Proc. Soc. Exper. Biol. Med. **31**: 487-488 (Jan.) 1934; Loss of Sensitivity to the Gonadotropic Hormone of the Hypophysis, ibid. **31**: 566 (Feb.) 1934. Selye, Hans; Bachman, C.; Thompson, D. L., and Collip, J. B.: Further Studies on Loss of Sensitivity to Anterior Pituitary-Like Hormone of Pregnancy Urine, ibid. **31**: 1113-1115 (June) 1934.

10. Collip, J. B.; Selye, Hans, and Thomson, D. L.: Gonad-Stimulating Hormones in Hypophysectomized Animals, Nature, London **131**: 56 (Jan. 14) 1933.

11. Leonard, S. L., and Smith, P. E.: Effects of Injecting Pregnancy-Urine Extracts in Hypophysectomized Rats: II. The Female, Proc. Soc. Exper. Biol. & Med. **30**: 1248-1249 (June) 1933.

12. Collip, J. B.; Selye, Hans, and Thomson, D. L.: Beiträge zur Kenntniss der Physiologie des Gehirnanhanges, Virchows Arch. f. path. Anat. **290**: 23-46, 1933.

13. Smith, P. E., and Leonard, S. L.: Effect of Injecting Pregnancy-Urine Extracts in Hypophysectomized Rats: I. The Male, Proc. Soc. Exper. Biol. & Med. **30**: 1246-1247 (June) 1933.

14. Evans, H. M.; Simpson, M. E., and Austin, P. R.: Recognition and Comparison of Prolan and Prolan-Like Substances, J. Exper. Med. **58**: 561 (Nov.) 1933.

15. Zondek, Bernhard: Die Hormone des Ovariums und des Hypophysenvorderlappens, Berlin, Julius Springer, 1931.

16. Jeffcoate, T. N. A.: Occurrence of Pituitary Hormones in Urine in Conditions Associated with Pregnancy, Lancet **1**: 662 (March 26) 1932. Brühl, R.: Weitere Untersuchungen über die Ausscheidung von Hypophysenvorderlappenhormon im Urin, Ztschr. f. Geburtsh. u. Gynäk. **101**: 403, 1932.

a corpus luteum. He also postulates the presence of another gonadotropic factor, "prolan B," which does not stimulate the growth of the follicle at all but transforms granulosa cells into corpus luteum cells. Both these substances would be present in pregnancy urine, while the urine of castrates would contain only "prolan A." Although no gonadotropic hormones can be demonstrated with direct methods in the placenta of rodents, there is some evidence for the presence of a factor, in the pregnant rat and mouse, that inhibits the involution of the corpus luteum of gestation even after the hypophysis is removed.[17] Even the mere mechanical distention of the uterus retards the involution of the pregnancy corpora.[18]

The differentiation of these gonadotropic principles is extremely difficult because the pituitary of the experimental animal secretes other hormones, which also influence the ovary. It is absolutely essential, therefore, to use hypophysectomized animals for this type of study.

Experiments on hypophysectomized rats have shown that extracts prepared from castrate urine will lead to follicle maturation in the female and to proliferation of the seminal epithelium and sperm cell production in the male (Leonard and Smith [19]). These extracts have no marked effect on the interstitial cells of the ovary or testis.

I should like to outline our conclusions regarding the mechanism of action and the nature of these hormones on the basis of the observations that one may consider as being really well established at the present time. In order to eliminate repetition, I shall not review here the literature concerning the physiology of the gonadotropic hormones, since this will be done by Smith in another paper of this series. The reader is referred to this article, where he will find accounts of the valuable contributions of Lipschütz, Hisaw, Swezy and their collaborators.

The development of the graafian follicle and its transformation into a corpus luteum may be divided into three different periods.[19a] The first stages of development are found in the ovary of rats between the first and the eighteenth day of life. At this period the granulosa cells do not respond to any known gonadotropic hormone, and the only effect that one can see after the administration of the anterior pituitary-like gonadotropic factor is the transformation of theca cells into theca-lutein cells,[20] while the pituitary gonad stimulating principle does not seem to have any effect at all. The nonresponsiveness of such immature ovaries to gonadotropic hormones lies in the ovary itself and not in its hormone environment, because these ovaries will not form mature follicles and corpora lutea even if they are transplanted into adult female castrates.

The second stages of development are found in the ovaries of rats after the eighteenth day of life, and in the ovaries of hypophysectomized animals. Up to this stage of maturation no pituitary hormones are needed. The experiments of Swezy [21] have shown that ovogenesis is not impaired after hypophysectomy, and since mitotic figures have frequently been found in the granulosa of hypophysectomized rats I feel that the maturation of the granulosa must also be independent of the pituitary hormones up to a certain stage in the development of the follicle. In this second stage the follicle is able to respond to the pituitary follicle-stimulating hormone but not to the anterior pituitary-like gonadotropic factor. If the latter is administered to hypophysectomized animals, only thecal luteinization will take place. If it is administered to the immature animal (around the eighteenth day of age) the follicles of which are also in this stage of development, the same preparation will produce follicle maturation with the subsequent luteinization of the granulosa only because the experimental animal's own pituitary is able to participate in the stimulation of the ovary.[22]

The third stages of development are found in the ovaries of animals in full estrus or of hypophysectomized animals after administration of follicle-stimulating hormone as obtained from castrate urine or pituitary tissue. This is the stage of full follicular development. At this time, and only at this time, the pituitary-like gonadotropic principle has a direct effect on the granulosa cells, which it is able to transform into corpus luteum cells.

This explains why the hypophyseal-like factor may lead to the formation of a true corpus luteum if injected into a rabbit immediately after hypophysectomy, since in this species fully mature follicles are almost continuously present in the ovary. It further explains why the injection of this substance into guinea-pigs does not lead to the formation of corpora lutea except in the presence of large follicles. Since this species responds to the pituitary-like principle in a manner similar to that of the hypophysectomized rat or rabbit, one may assume that the hypophysis of the guinea-pig does not participate with the injected anterior pituitary-like substance in follicular stimulation. This interpretation would also make Engle's [23] experiments on monkeys more comprehensible. The monkey seems to react very much like the guinea-pig in that here again the pituitary-like factor produces luteinization only after the follicle has responded to hypophyseal stimulation.

It seems necessary at the present time to postulate two hypophyseal gonadotropic hormones, one follicle stimulating and one that luteinizes the theca and the mature granulosa while it has no effect on the immature granulosa cells. The so-called prolan A of menopausal urine appears to consist chiefly of the former, or at least to resemble it closely, whereas the placental hormone of pregnancy urine ("prolan A" plus "prolan B" of Zondek's original terminology) is more comparable, in its biologic relations, to the luteinizing fraction.

17. Selye, Hans; Collip, J. B., and Thomson, D. L.: Effect of Hypophysectomy upon Pregnancy and Lactation in Mice, Proc. Soc. Exper. Biol. & Med. **31:** 82-83 (Oct.) 1933; Studies on the Effect of Pregnancy on the Ovary, Anat. Rec. **58:** 139-143 (Jan. 25) 1934; Effect of Hypophysectomy upon Pregnancy and Lactation, Proc. Soc. Exper. Biol. & Med. **30:** 589-590 (Feb.) 1933.

18. Selye, Hans: Influence of the Uterus on Ovary and Mammary Gland, Proc. Soc. Exper. Biol. & Med. **31:** 488-490 (Jan.) 1934.

19. Leonard, S. L., and Smith, P. E.: Ovarian Response of Hypophysectomized Rats to Urinary Follicle-Stimulating Principle, Proc. Soc. Exper. Biol. & Med. **31:** 283-284 (Nov.) 1933.

19a. The effect of age on the response to gonadotropic hormone is discussed more fully in a paper to be published by Selye, Hans; Collip, J. B., and Thomson, D. L.

20. Selye, Hans, and Collip, J. B.: Production of Exclusively Thecal Luteinization and Continuous Oestrus with Anterior-Pituitary-Like Hormone, Proc. Soc. Exper. Biol. & Med. **30:** 647-649 (Feb.) 1933. Selye, Hans; Collip, J. B., and Thomson, D. L.: Further Studies on Production of Thecal Luteinization by Means of A. P. L., ibid. **30:** 780-783 (March) 1933.

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Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

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CHICAGO

NOTE.—*In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The series of articles will be continued from time to time in these columns.*—ED.

THERAPY OF VARICOSE VEINS AND ULCERS

If there is a retrograde blood current in the varicose veins when the patient is in the upright posture, the tissues whose blood should be drained by these veins are supplied by venous instead of arterial blood. Even if the current is not actually retrograde, it becomes so sluggish as to amount to almost the same thing. This accounts for the difficulty of healing varicose ulcer and varicose eczema until the venous stagnation or reversal in capillary flow, as the case may be, has been corrected. This may be done by one of four methods or a combination of these: (1) rest and elevation; (2) supporting bandages; (3) sclerosing injections; (4) surgical ligation of the long saphenous vein.

REST AND ELEVATION

Prolonged bed treatment with elevation of the affected limb to 45 degrees or higher so as to reestablish the centripetal direction of the blood current in the varicose veins is no longer practiced, for the results of this treatment were merely temporary and, as soon as the patient became ambulatory, the ulcers or dermatitis returned.

A person afflicted with varicose veins should keep the legs elevated whenever possible and avoid prolonged standing, which is much worse than is walking, as the pumping action of the muscles favors return flow in the deep veins.

If the patient will not or cannot employ any other treatment, it is quite advantageous for him to sleep with the feet raised about 7 inches above the level of the pelvis (the elevation produced by means of a skeleton wooden wedge placed under the mattress or, more simply, by raising the foot end of the bed). If there is a tendency to edema at bedtime, a mid-day siesta in the same posture should be insisted on.

SUPPORTING BANDAGES

Supporting bandages act chiefly by making the valves of the damaged veins more nearly adequate.

(*a*) *Elastic Stockings.*—The constant wearing, when the patient is up and about, of an elastic stocking or, what is less expensive, a "crape" bandage, is a necessary prophylactic to trouble for all those afflicted with or prone to the development of varicose veins, for example, in pregnancy. The bandage should be applied each morning before rising, even before the leg is put out of bed and while the affected limb still has the advantage of the overnight relief of fluid stagnation, and it should not be taken off until the patient goes to bed for the night. It must be worn regularly. These bandages should extend from the metatarsal region to at least half way up the thigh, leaving the front of the knee free. It should be made in two parts, one reaching from the toes to just below the knee, the other from the knee to the middle of the thigh. A one-piece stocking is liable to interfere with the movements of the limb and to constrict the circulation about the knee. An intrinsic disadvantage of the elastic stocking, even if it fits well at first, is that it soon becomes worthless either from loss of elasticity or from change in the size or shape of the limb.

(*b*) *The Elastic Crape Roller Bandage.*—This bandage, 4 inches wide (e. g., the "Ace"), has the advantage not only of being less expensive but also of always fitting if properly applied and being washable without losing elasticity, provided the cotton fibers when wet are not stretched, as by wringing or by hanging up to dry.

(*c*) *Elastic Adhesive Bandage.*—This application has revolutionized the treatment of varicose ulcer. The principle underlying this method, enunciated by A. Dickson Wright in 1930, is to apply elastic adhesive plaster strapping with sufficient tension to abolish the circulation in the varicose veins. The patient is kept ambulant and the ulcer is dressed in nothing but its own discharge. If the ulcer is large and the edema considerable, longitudinal strips of adhesive plaster are placed on both sides up the leg to prevent the cutting of grooves in the edematous leg and to keep the bandage from slipping out of position on the surface of the ulcer, which is too moist for the bandage to adhere to. This precaution is not necessary when the ulcer is small or the edema moderate. The elastic adhesive plaster (such as "elastoplast") is wound as firmly and evenly as possible, overlapping each turn of the bandage one half of its width by the ensuing turn. When the edema is great, it may be necessary to use all one's strength in applying the plaster; for looseness of the bandage is the chief cause of failure, and the bandage becomes loose as the edema diminishes. Later applications require less pressure. The patient takes his baths with the plaster in position. He is instructed to wipe off or wash off any discharge that may appear on the surface and to protect the stockings by putting an absorbent gauze dressing over the bandage. The bandage is changed when it has become loose, which may be twice weekly. Later it may be left on for eight days or longer. The bandage is removed, like a cast, by cutting up one side.

Incorporating in the elastic compression bandage a rubber sponge about an inch larger than the ulcerated area (which is first covered with moist sterile dressing so as to favor drainage, the moist sterile dressing being covered with dry sterile dressing, and this with the rubber sponge) has been likened by McPheeters to bringing a "rubber heart" to the aid of the healing, provided the patient walks enough. (McPheeters uses a 4 inch crape ["Ace"] bandage and changes the dressing every other day.) If the ulcer is large and as soon as a healthy granulating surface has been secured, seed implants (see Ulcer Therapy) should be inserted in the granulations and the elastic pressure applied over the grafts, the taking of which it favors. Sclerosing injections may be employed prior to the application of the elastic adhesive bandage and each time it is changed, thereby not only expediting the healing of the ulcer but also preventing its recurrence.

(*d*) *"Unna's Boot."*—This is especially indicated by varicose eczema, but it is also suitable for chronic leg ulcer, provided there is no edema of the leg. Thus it

is an excellent succedaneum to the elastic adhesive bandage when the tendency to edema has been overcome.

For success with this treatment it is essential that the ulcer be free from gross infection (see Ulcer Therapy) and that the circumference of the limb should have been reduced as much as possible. If there is much edema of the leg, a day or two in bed with elevation of the limb is necessary. If there is but little edema, the boot should be applied before the patient has been allowed to get out of bed in the morning and after five or ten minutes of extreme elevation of the part. The leg should have been rendered scrupulously clean and be shaved if it is hairy.

Dr. Leroy H. Sloan describes a technic of applying Unna's boot that, as compared with the method ordinarily advised, is time and trouble saving. A sufficient quantity of the Soft Zinc Glycerogelatin (N. F.) for use in winter, or of the Firm Zinc Glycerogelatin (N. F.) for use during the summer, is melted, just before it is needed, by the application of the least amount of heat necessary. Starch bandages about 2½ inches wide, such as the ophthalmologist employs to cover the eye following operative procedures, are put directly into the melted gelatin preparation, pushed down deep into it and kept there until the bandage is soaked thoroughly. The bandage is then wrapped on the limb just like an ordinary bandage excepting that it is not reversed at any point. Over the last layer of the starch-gelatin paste bandage an ordinary gauze bandage is placed.

The indications for removing the "boot" are soiling and not fitting any longer. Profuse exudate from an ulcer may make it necessary to change the boot twice a week. To cut a "window" over the discharging ulcer is not permissible. Usually the boot may be allowed to remain for several weeks and sometimes even for months. This treatment should not be discontinued soon after healing has occurred for fear of recurrence of the ulcer or the dermatitis, and the boot should be promptly reapplied at the first sign of the reappearance of the lesion.

Definitely to free the patient from the likelihood of these recurrences, the destruction of varicose veins becomes necessary and sclerosing injections have made it possible to do this, in the majority of cases, without the necessity of hospitalization.

3. *Sclerosing Injections.*—Before destroying varicose veins, it is important for the physician to ascertain that they are superfluous. A person whose deep veins are thrombosed requires the superficial venous circulation, even if it is varicose, to carry the blood away from the limb. A history of previous phlebitis of the leg suggests deep vein thrombosis as a probability, which can be converted into a certainty by the Perthes test. By means of a flannel bandage one occludes the superficial veins and has the patient walk for an hour and return. Pain, discoloration and swelling of the foot indicate that the case is not suitable for any form of vein destruction and that the best that can be done for the patient is to employ, along with rest and elevation, one of the supporting bandages applied as tightly as is comfortable.

No one, of course, would undertake injection treatment of veins in the presence of fresh phlebitis. It is also important to recognize residual infection in veins before undertaking the injection treatment, as this would activate it into an acute phlebitis (q. v.). In addition to a history of preceding phlebitis, tender thickened veins and palpable phleboliths as well as a rise in the temperature of the skin overlying such veins should suggest application of one of three provocative procedures (Géza de Takáts, 1932): 1. Roentgen irradiation with 150 roentgens applied with 140 kilovolts, 0.25 mm. of copper and 1 mm. of aluminum to both legs, which is followed by rise in skin temperature if infection is present. 2. Diathermy applied for five minutes over the suspected area, which gives a rise in skin temperature the next day, as compared with the other leg also treated. 3. Puncture of the veins without injection. If such infection is present, foreign protein therapy and a supporting bandage, together with removal of foci of infection, may render the provocative tests negative several months later, whereupon injection treatment may be employed.

The presence of infection anywhere else in the system such as acute catarrh of the upper respiratory tract, and septic tonsils or teeth, contraindicates these sclerosing injections. So does advanced age or the presence of severe systemic disease, such as diabetes mellitus, nephritis or obstructive heart or lung disease.

PRESCRIPTION 1.—*Quinine and Urethane Solution*

℞ Quinine hydrochloride ..... 0.4 Gm.
Ethyl carbamate ..... 0.2 Gm.
Distilled water ..... 3.0 cc.

Sterilize by boiling and dispense in ampule. Inject 2 cc. at an average.

PRESCRIPTION 2.—*Concentrated Salt Solution*

℞ Sodium chloride ..... 2.0 Gm.
Distilled water ..... 10.0 cc.

Sterilize by boiling and dispense in ampule. Inject from 5 to 10 cc., according to the size of the varix.

Bernstein's classification of the Trendelenburg tests and their correlation with pathologic conditions may be of value in developing the indications for and the prognosis of the injection treatment. In performing the Trendelenburg test, the veins of the leg are emptied by elevating the limb and by gently stroking the veins toward the femoral ring. The hand then makes pressure at the fossa ovalis and the patient is asked to stand. Normal filling from the periphery distends the veins moderately in about a minute even while the pressure is applied. The presence of valvular insufficiency in the long saphenous vein causes, on removal of the hand, the nonsupported column of blood to fill all the varices rapidly from above downward. This is spoken of as the "Trendelenburg positive" (T+) reaction. If incompetent valves are present in the veins connecting the deep and superficial venous system, rapid filling (within ten to twenty seconds) of the varices occurs even while pressure is being maintained over the fossa valves. This is the "Trendelenburg negative" (T—) reaction. A combination of the two conditions might be spoken of as a "double Trendelenburg" (T±). If there are no valvular defects but merely sacculated veins, Bernstein calls this condition a "Trendelenburg nil" (T 0). It is in the last mentioned that best and promptest results are secured from the injection treatment. A positive Trendelenburg reaction indicates ligation of the long saphenous vein before injections are started; otherwise recanalization of the thrombus

is likely to occur within a few months. Such ligation is also indicated when there is a double Trendelenburg reaction. But in this case as well as when there is a Trendelenburg negative reaction a great many injections will be required and these may not have a lasting effect.

Among the numerous competing injection fluids, the solution of Quinine and Urethane (prescription 1) is the outstanding one. It is only when the patient has an idiosyncrasy against quinine or the varices are extremely large that from 5 to 10 cc. of a concentrated solution of Sodium Chloride (prescription 2) is employed. This solution has the disadvantage of causing a severe cramp in the muscles of the leg.

During the performance of the injection it is perhaps most convenient to have the patient stand on a bench about 18 inches above the floor. After proper cleansing, the injection is made, beginning generally with the lowest varicosity and working upward. An exception to this rule occurs in cases of ulcer, in which the varices above the knee—but not much higher than a hand's breadth above—are injected, until the ulcer has been healed. Then injections should be employed to obliterate the varicosities in the leg; otherwise the ulceration is liable to recur.

The vein does not need to be emptied prior to injection. There is no necessity for any apparatus to segregate a portion of the vein. All the equipment required is a syringe and a 22 to 26 gage needle with a short bevel. A sterile gauze pad held in place by adhesive plaster is the final dressing. Should paravenous injection occur, the syringe should be disconnected at once from the needle and the tissue blown up through the needle with sterile fluid, preferably 1 per cent solution of procaine in 5 to 10 cc. amounts, which it is always well to have at hand when one gives these injections.

4. *Surgery.*—Surgical procedures are at present confined to the ligation of the long saphenous veins in those cases in which its valves are incompetent, and this is best done before the injection treatment is commenced to prevent recanalization of the thrombus.

Operation as suggested by Nelson J. Howard is done as follows: If the saphenous vein is not visible in the upper part of the thigh, it is traced by palpation of the impulse transmitted on percussion. Under scrupulous asepsis and local infiltration anesthesia, the internal saphenous vein is exposed by a transverse incision at the junction of the upper and middle thirds of the thigh. Without unnecessary trauma, the vein is freed from surrounding areolar tissue. Medium silk ligatures are applied 1 inch apart. After they are tied, the ligatures are left long to serve as traction sutures after the vein has been cut between them. To make certain that the ligature may not blow off under exertion, the proximal stump is then transfixed and tied distally to the ligature, trauma of the proximal stump from forceps and other causes being carefully avoided. Then holding the distal stump of the vein taut by means of the long ligature, one injects in a centrifugal direction from 10 to 20 cc. of 20 per cent solution of Sodium Chloride. After this the vein is again tied to prevent escape of the hypertonic solution. The wound is flushed with physiologic solution of Sodium Chloride and closed with interrupted sutures, and a sterile dressing is applied. The patient may go home and work even on the day of the operation but should return for frequent postoperative inspection of the wound. Skin sutures are removed in a week.

5. *Causal Therapy.*—It is, of course, understood that any discoverable etiologic factor for the varicosities is to be corrected. This applies most especially to constipation and to pelvic tumors. Rest, elevation, and supporting bandages (indications 1 and 2) should be resorted to as a routine during pregnancy to protect women as far as possible against these blemishes. Persons with a tendency to varicosities of the legs must be enjoined against wearing garters or clothing that constricts the abdomen. Excessive fatigue and especially prolonged standing must be avoided. If standing is unavoidable, one should practice as often as possible (from ten to fifteen times daily) deep breathing and foot rolling as well as leg and thigh flexion and extension exercises (such as in bicycling). The presence of a low metabolic rate, suggesting a tendency to myxedema, should be met by thyroid administration. A reducing diet might be required in an obese individual; dietary control and, if necessary, insulin in the diabetic patient, or hematinic therapy in the anemic person.

6. *Systemic Therapy.*—Even though true syphilitic or mycotic ulcers have an essentially different pathology and symptomatology, it is decidedly possible for syphilitic infection or mycotic invasion to delay the healing of leg ulcers or make it impossible, just as vein flow reversal or stagnation may make a syphilitic or mycotic ulcer incurable, unless the varicosities are properly dealt with. Hence the therapy of syphilis (q. v.) or of the mycoses (q. v.) needs to be associated when there is coincidence of these conditions.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

SONOTONE HEARING AID ACCEPTABLE

This device is manufactured by the Sonotone Corporation of New York City. The outfit consists of a transmitter, booster, ear or bone conduction receiver, and a battery. The principle of operation of the Sonotone does not differ greatly from a simple telephone hook-up. The sound waves are picked up by the microphone, amplified by the booster, and transmitted to the hearing organs of the ear by the bone conduction unit, the oscillator, or through air by the air conduction unit, the earpiece.

In the earpiece type, sound waves are converted by the transmitter into the varying electrical currents drawn from the battery and are conveyed to the earpiece, where they create more or less powerful vibrations of the diaphragm in the earpiece; these mechanical vibrations are then reconverted into sound waves. When the earpiece is placed in or on the outer ear, an air cushion is created between the earpiece and the membrana tympani or drum membrane, chiefly in the canal of the outer ear. The reconverted sound waves of the earpiece are conveyed through this air cushion to the drum membrane and there are again converted into mechanical vibrations, which then are conveyed from the drum membrane to the chain of auditory organs of the middle and subsequently of the inner ear.

In the bone conduction hearing aid, sound waves are converted by the transmitter into electromechanical vibrations, which also bring about variations of electric current drawn from the battery, and these varying electric currents are con-

veyed to the oscillator, where they create relatively greater varying mechanical vibrations. The oscillator, quite unlike the earpiece, does not reconvert these mechanical vibrations into sound waves. Instead, it conveys these mechanical vibrations, as such, to the bones of the head and from there directly to the auditory organs.

One unit was tried out in actual service under the supervision of the consultant of the Council and was found to give satisfactory service. The especially designed dry cell batteries appeared to hold up well, indicating that the current demand was not great. Both the air conduction and bone conduction instruments gave satisfaction, and the selection of the method depends on the conditions of the case. It was found that under some circumstances certain deafened individuals were able to hear better by air conduction, while others heard better by the bone conduction. The selection of the method is left to the discretion of the physician.

The company recommends the use of the special batteries. The reason for this is that the dry cells are manufactured for heavy duty and are different in construction from the ordinary flashlight batteries. Flashlight batteries are designed for long shelf life at the expense of other valuable features. It follows, therefore, that the hearing-aid batteries should give good service if they are not permitted to stand on the shelf more than six months.

In view of the results of the investigation, the Sonotone Hearing Aid is included in the Council's list of accepted devices.

ALOE DOUBLE THERAPY LAMP ACCEPTABLE

The A. S. Aloe Company, St. Louis, is the manufacturer of this therapeutic lamp. The unit is mounted on a stand and may be conveniently moved about, and the reflector, mounted on a cross arm, is adjustable to any position. The arc is protected by a screen. This unit is called a double therapy carbon arc ultraviolet lamp, because it is possible to make use of the various kinds of carbon, for example, the A Sunshine Carbon, the C therapeutic carbons and the K carbons. The physician may select the carbon that gives the radiation which he desires.

Aloe Double Therapy Lamp.

It combines in one unit a carbon arc and a ring type infra-red generator. The unit consists principally of a resistance unit, a single carbon arc automatic in adjustment, and a 1,000 watt infra-red generator. The carbons are 8 mm. by 6 inches and the lamp draws 15 amperes across the arc.

The mechanism of the unit is so arranged that either the carbon arc or the infra-red burner may be used independently of the other or the two units may be used simultaneously. The lamp may be used with direct or alternating current without further adjustment.

At a distance of 24 inches the carbon arc will produce a "mild sunburn" reaction in three minutes, using a therapeutic C carbon, or within forty-five seconds at a distance of 10 inches, "with visible reddening of the skin several hours later and subsequent granular exfoliation."

The carbon holders are operated entirely outside the bowl of the lamp, thus facilitating their replacement while the lamp is in operation. An automatic blowout prevents the destruction of carbon holders.

The 14 inch polished aluminum hood is universally adjustable to any required position and is provided with a heavy and rigid protective screen. The base is so designed that the extended weight of the bowl cannot tip the lamp over.

This lamp was investigated for the Council and the claims made for it were substantiated. The Double Therapy Lamp, therefore, is included in the Council's list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

DIPHTHERIA TOXOID (See New and Nonofficial Remedies, 1934, p. 390).

The National Drug Co., Philadelphia.

Diphtheria Toxoid.—(See New and Nonofficial Remedies, 1934, p. 392):

For determining sensitivity to diphtheria toxoid the product is supplied in the form of a 1:20 dilution. The test dose is 0.1 cc. injected intradermally. Supplied in packages of five and fifty tests.

DIPHTHERIA IMMUNITY TEST (SCHICK TEST) (See New and Nonofficial Remedies, 1934, p. 404).

Lederle Laboratories, Inc., Pearl River, N. Y.

Diphtheria Toxin for Schick Test in Peptone Solution.—(See New and Nonofficial Remedies, 1934, p. 405).—Also marketed in packages of one vial containing diluted diphtheria toxin sufficient for fifty tests.

STAPHYLOCOCCUS TOXOID.—Staphylococcus Anatoxin.—Univalent or polyvalent, potently hemolytic and dermonecrotic toxins of Staphylococcus pyogenes-aureus altered by the formaldehyde-detoxifying process of Burnet (modified from Ramon). Antigenicity is maintained but toxicity is greatly diminished.

Actions, Uses and Dosage.—Staphylococcus toxoid has been reported a valuable agent in the prophylaxis and therapy of various staphylococcic pyodermas and localized pyogenic processes due to Staphylococcus aureus (boil, carbuncle, furunculosis, acne, and so on). The toxoid is said to be effective in producing active immunity to the dermonecrotic and hemolytic elements of the toxins of Staphylococcus aureus and albus, irrespective of the individual strain of the infecting organism. The toxoid induces the production of quantitative amounts of staphylococcus antitoxin in the blood serum of immunized persons. Treatment consists in the subcutaneous or intramuscular injection at two to seven day intervals of an amount of toxoid representing the following dermonecrotizing units of toxin (a dermonecrotizing unit is the least amount of toxin which on intradermal injection will produce an erythema with central necrosis at least 5 by 5 mm. in diameter):

First	injection.....	20 units
Second	injection.....	40 units
Third	injection.....	60 units
Fourth	injection.....	80 units
Fifth	injection.....	100 units
Sixth	injection.....	200 units
Seventh	injection.....	400 units
Eighth	injection.....	600 units
Ninth	injection.....	800 units
Tenth	injection.....	1,000 units

Following the completion of the tenth injection, subsequent treatment, if necessary, may be maintained at that dosage or increased as the progress of the individual case may indicate.

Lederle Laboratories, Inc., Pearl River, N. Y.

Staphylococcus Toxoid-Lederle.—Prepared by treating a staphylococcus toxin filtrate with 0.3 per cent solution of formaldehyde and storing at 37-38 degrees C. until 0.1 cc. injected intradermally into previously tested rabbits produces no evidence of necrosis. The product is then diluted with 0.25 per cent peptone solution so that two strengths are obtained: Dilution No. 1, containing in each cubic centimeter the toxoid obtained from 100 necrotizing doses of toxin; and Dilution No. 2, containing in each cubic centimeter the toxoid obtained from 1,000 necrotizing doses of toxin. The material is then preserved with merthiolate 1:10,000. The usual sterility tests prescribed by the National Institute of Health are made. Safety tests are made by injecting 1 cc. doses into each of two mice. The potency of the original toxin is tested by making serial dilutions and injecting 0.1 cc. of each dilution intracutaneously into susceptible rabbits in order to determine the maximum dilution which will cause necrosis. The least amount of toxin which produces an area of erythema with a central necrosis at least 5 mm. in diameter is taken as one necrotizing dose of toxin.

Staphylococcus Toxoid-Lederle is marketed in packages of one 5 cc. vial, each cubic centimeter containing the toxoid derived from 100 necrotizing doses of toxin; and in packages of one 5 cc. vial, each cubic centimeter containing the toxoid derived from 1,000 necrotizing doses of toxin.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING GENERAL DECISION AND REPORT. RAYMOND HERTWIG, Secretary.

FORTIFICATION OF FOODS OTHER THAN DIETARY STAPLES WITH VITAMIN D

There is no convincing evidence from the standpoint of public health of a need for the fortification of foods with vitamin D other than such staple products as milk, cereals and bread, which form the basis of the customary diet of the public throughout the year. It is nutritionally unreasonable to add vitamin D to foods consumed mostly in the summer when sunshine is sufficient for producing this vitamin in the body, or to foods consumed irregularly, especially in the fall, winter and spring months. An important prerequisite in the choice of food for incorporating vitamin D is that it be consumed regularly and in considerable quantity in the usual diet throughout the year.

Examples of foods not warranting fortification with vitamin D are sausage and ice cream and such accessories as chewing gum.

NOT ACCEPTABLE

PONY BRAND ARTICHOKE CREAM PULP

The Bottled Pure Juice Company, Campbell, Calif., submitted to the Committee on Foods a cooked, pulped, strained artichoke with added citric acid and salt, called "Pony Brand Artichoke Cream Pulp."

Manufacture.—Fresh artichoke, free of outer leaves, leaf tips and stems, is washed, boiled until tender, pressed to remove excess water, pulped, strained, admixed with a small quantity of citric acid and salt, heated, canned and processed.

Analysis (submitted by manufacturer).—	per cent
Moisture	87.1
Total ash	1.6
Sodium chloride	0.5
Fat (ether extract)	0.7
Protein (N × 6.25)	2.4
Reducing sugars as dextrose before inversion	3.7
Reducing sugars as dextrose after inversion	6.3
Crude fiber	1.0
Carbohydrates other than crude fiber (by difference)	6.3
Titratable acidity as citric acid	0.9

Calories.—0.4 per gram; 11 per ounce.

Discussion of Product, Name and Label.—The label bears the statements:

> "Artichoke Cream Pulp. This Artichoke Pulp contains no starch nor sugar, and consequently is very beneficial to all those with delicate stomachs, those suffering with diabetes, and while it is highly nutritive, is not fattening."

It is apparently the intention of the company to exploit the article as a "special purpose food," as shown by the label statement "it is very beneficial to all those with delicate stomachs, those suffering with diabetes . . . is not fattening." The product is essentially useless as a "special purpose food" or for the stated uses. It is no more suitable for the low carbohydrate diet than any canned "5 per cent vegetable." It has no special value for "those with delicate stomachs, those suffering with diabetes" or the obese. The claim implies medicinal properties not possessed. Contrary to the label statement, the product contains a substantial amount of sugar.

The name and label do not correctly or appropriately inform of the nature of the food. The citric acid and salt ingredients should be declared along with the name "Cream Pulp." Part of the name incorrectly suggests the presence of cream, a constituent of milk. A proper name for the product is "Pulped, Strained Artichoke (Added citric acid and salt)."

Because of its uselessness as a special purpose food and of the deceptive name and label statements, this product, therefore, cannot be listed as an accepted food of this Committee.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

STOKELY'S FOR BABY SPECIALLY PREPARED STRAINED CEREAL WITH ADDED WHOLE MILK, SOY BEAN FLOUR, TRI-CALCIUM PHOSPHATE AND YEAST, SEASONED ONLY WITH SALT

Manufacturer.—Stokely Brothers & Company, Inc., Indianapolis.

Description.—Cooked sieved blend of farina, rolled oats, wheat germ, barley flour, whole milk, soy bean flour, yellow corn meal, salt, tri-calcium phosphate and brewers' yeast.

Manufacture.—The ingredients in formula proportions are cooked in milk to 88 C., sieved through a monel screen, canned in enamel lined cans, and processed under pressure at 116 C. for ninety-five minutes.

Analysis (submitted by manufacturer).—	per cent
Moisture	86.8
Total solids	13.2
Ash	1.2
Sodium chloride	0.5
Fat (ether extract)	1.1
Protein (N × 6.25)	2.6
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	8.0
Calcium (Ca)	0.26
Copper (Cu)	0.0001
Iron (Fe)	0.002
Manganese (Mn)	0.0003
Phosphorus (P)	0.25

Calories.—0.5 per gram; 14 per ounce.

Vitamins.—The manufacturing equipment and procedure by excluding air are protective of the vitamin content.

Claims of Manufacturer.—This strained cereal cooked in milk is especially prepared for infant feeding, children, convalescents and special diets. Packed in enamel lined cans. Requires only warming for serving.

IRRADIATED VITAMIN D PASTEURIZED MILK

Distributors.—Brighton Place Dairy Company, Inc.; General Ice Cream Corporation (New Haven Dairy Division), New Haven, Conn.

Description.—Bottled pasteurized vitamin D milk irradiated with ultraviolet rays.

Preparation.—The milk complies with legal requirements and is pasteurized by the standard holding method. For description of irradiation, see THE JOURNAL, Oct. 7, 1933, page 1155. The type of equipment used is the Hanovia-National Milk Irradiator.

Vitamins.—Clinical investigation shows this milk to be a reliable antirachitic agent if the proper amount is used. Contains 135 U. S. P. X (Revised, 1934) vitamin D units per quart.

Claims of Distributors.—Irradiated antirachitic pasteurized milk having otherwise the flavor and food values of usual pasteurized milk.

FREEPORT TIP-TOP BREAD, SLICED

Manufacturer.—Freeport Baking Company, Freeport, Ill.

Description.—Sliced white bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from flour, water, sucrose, shortening, powdered skim milk (sweetened condensed whole milk used in winter), yeast, sodium chloride, malt extract, gelatinized white corn flour, soya bean flour and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

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SATURDAY, FEBRUARY 16, 1935

EFFECT OF DIET IN EXPERIMENTAL AMEBIASIS

The extreme variability in the clinical and pathologic manifestations of intestinal amebiasis has long been puzzling. Many plausible theories have been adduced to explain, for instance, why one person may harbor Endamoeba histolytica in the intestinal tract for years, without apparent clinical symptoms and without serious damage to the body tissues, while another may have the mucosa of the colon practically denuded in the space of a few days from the ravages of this protozoon. The alternating periods of clinical quiescence and exacerbation in many patients also confuse the problem. Orthodox immunology appears to offer little in the way of a solution.

Those with wide experience in the treatment of amebiasis, especially in the tropics, find that diet plays a large part in the severity of infection with Endamoeba histolytica; persons who have been on a restricted diet, particularly one high in carbohydrate, often have a more virulent infection than those on a full diet or on one low in carbohydrate. But the reasons presented in explanation of this phenomenon have been merely conjectural.

Recently, Faust [1] and Kagy [2] and their co-workers [3] of Tulane University have reported the results of a series of studies on the effect of diet on experimental amebiasis in dogs; these promise to be of the utmost importance in contributing to the understanding of this difficult problem and in improving the methods of treatment of the disease in man. The New Orleans investigators have determined the effects of raw liver, liver extract, other liver fractions, cod liver oil, desiccated hog stomach and canned salmon when added to the diet of dogs infected by intracecal inoculation [4] of Endamoeba histolytica. Dogs so inoculated develop severe acute amebic enteritis with extensive ulceration of the colon; ordinarily only the trophozoite stage of the parasite can be recovered from the stool.

Feeding raw liver or liver extract in adequate amounts to such dogs causes rapid and definite clinical improvement and healing of the intestinal lesions. The stool tends to become dehydrated and formed; the amebas encyst and may disappear from the feces altogether. Although ordinarily only the active form of the ameba is found in the wall of the intestine, encysted organisms may be seen behind healed surface lesions after liver feeding. The mechanism whereby raw liver or liver extract changes the course of intestinal amebiasis is not known. In part the effect appears to be related to the tendency toward dehydration of the feces; but, as Faust and Kagy [2] point out, there are undoubtedly other factors involved in this process. Raw liver or liver extract is not amebicidal but amebostatic; in some of the animals under therapy with raw liver, complete eradication of Endamoeba histolytica has been noted, but this does not occur uniformly. Faust and his co-workers [3] found that greater and more rapid improvement took place when the raw liver was finely chopped than when it was ingested whole. Still more rapid improvement occurred if both the liquid and solid fractions of finely chopped liver were introduced intracecally. The active material is apparently destroyed by heating in an autoclave at 17 pounds pressure for twenty minutes; rapid exacerbation of the condition occurred following oral or intracecal administration of liver so treated. Also, after heating at 70 C. for thirty minutes to coagulate proteins, the washed solid material was ineffective on oral administration but the liquid fraction produced healing. Cod liver oil also has been found to have a beneficial effect.[1]

In contrast to the ameliorative effect of most of the liver products, the oral or intracecal administration of desiccated stomach or the feeding of canned pink salmon caused rapid and severe exacerbation of the disease. However, if the desiccated hog stomach was previously subjected to the heat of an autoclave at 17 pounds pressure for twenty minutes, oral or intracecal administration resulted in improvement rather than exacerbation. Or when whole salmon was given intracecally instead of orally, improvement also occurred; but peptic or tryptic digests of the salmon injected into the cecum resulted in serious aggravation of the enteritis.

While the explanation of these important investigations of Faust and his collaborators is not yet clear, their observations are of the greatest importance to an understanding of the processes involved in amebiasis and promise to be of inestimable value in the prevention and treatment of this disease.

1. Faust, E. C.: Experimental Amebiasis in Dogs, Am. J. Trop. Med. **12**: 37 (Jan.) 1932.

2. Kagy, E. S., and Faust, E. C.: Effect of Feeding Raw Liver to Dogs Infected with Endamoeba Histolytica, Proc. Soc. Exper. Biol. & Med. **28**: 252 (Dec.) 1930. Faust, E. C., and Kagy, E. S.: Studies on the Effect of Feeding Ventriculin, Liver Extract and Raw Liver to Dogs Experimentally Infected with Endamoeba Histolytica, Am. J. Trop. Med. **14**: 235 (May) 1934.

3. Faust, E. C.; Scott, L. C., and Schwartzwelder, J. C.: Influence of Certain Foodstuffs on Lesions of Endamoeba Histolytica Infection, Proc. Soc. Exper. Biol. & Med. **32**: 540 (Dec.) 1934.

4. Faust, E. C., and Kagy, E. S.: Studies on the Pathology of Amebic Enteritis in Dogs, Am. J. Trop. Med. **14**: 221 (May) 1934.

THE ANEMIA OF PREMATURE INFANTS

The investigations that have been conducted in the modern "renaissance of hematology," particularly those dealing with the anemias of infancy, have yielded information of interest. The fact has been well established that the hemoglobin level of normal, full-term infants, which is extraordinarily high at birth (from 18 to 20 Gm. per hundred cubic centimeters), decreases progressively after birth to a moderately anemic level of approximately 10 Gm. per hundred cubic centimeters of blood and thereafter increases slowly during the years of childhood and adolescence to an adult level. Similar but more definite changes occur in the blood of premature infants. The early fall in the hemoglobin level is more rapid and more pronounced than in full-term infants. Indeed it appears that, the greater the degree of prematurity, the lower the hemoglobin level reached, values as low as 7 Gm. per hundred cubic centimeters being occasionally found. Anemias of this degree must be regarded as pathologic. While it is probable that a low percentage of hemoglobin in itself is not harmful, it may well be indicative of a condition that renders the infant more likely to succumb to infections and other disease processes. Therefore knowledge of the cause and hence of the rational therapy of the anemia of prematurity is of prime importance.

According to current opinion,[1] three main mechanisms may be concerned in the development of the anemia of prematurity: (*a*) Deficient antenatal storage of iron or perhaps copper or some other essential hematogenic material; in the premature infant this factor might conceivably be exaggerated by the shortened period available for the storage of blood-forming substances. (*b*) Deficient blood formation due to marrow hypoplasia. (*c*) Increased blood destruction.

Recent investigations [2] have yielded further information indicating that a deficient storage of iron, copper and probably other essential material is not primarily responsible for the early anemia of premature infants. Hemoglobin, erythrocytes and reticulocytes were followed in groups of infants of varying degrees of prematurity for as long as three or four months. At different stages of the experiment, iron, copper or liver was administered and the hematologic effects were noted. Iron given during the period of from six to ten weeks after birth had no effect on the proportion of reticulocytes or on the hemoglobin and erythrocyte levels. The usual decrease in these values was unaffected. After the early period of nonreactivity there followed a short "transition" period in which iron elicited a delayed response. After the third month, iron therapy produced a prompt reticulocyte rise and the usual subsequent increase in pigment and erythrocytes. Similar results were obtained with liver given at the different periods. Copper, in the few cases studied, appeared to have no demonstrable effect.

As a deficient supply of iron, copper and the hematogenic material in liver is apparently not involved in the etiology of the early anemia of prematurity, the other suggested factors become of added interest. There is some evidence that hypoplasia of the erythroid element of the bone marrow, in a strict anatomic sense, is not responsible for the anemia. The fact that, in the investigation cited, a continued reticulosis was observed during the period of the development of the anemia is not indicative of an inactive marrow. On the other hand, certain experiments indicate that increased blood destruction may be responsible for the rapid fall in hemoglobin. The high concentration of bilirubin in the serum of premature infants during the first few weeks after birth and the slightly low osmotic resistance of the erythrocytes are examples of the evidence in favor of this point of view. The present available information, however, does not permit a final statement concerning the relative importance of a lack of blood formation and increased blood destruction. It is possible that both are involved. Further studies of these two factors, as well as others such as growth and hydration effects, should yield information of value in the final elucidation of the cause and proper therapy of the anemia of premature infants.

1. Mackay, H. M. M.: Factors Causing Variation in the Hemoglobin Level with Age in the First Year of Life, Arch. Dis. Childhood **8**: 251 (June) 1933. Parsons, L. G., and Hawksley, J. C.: Studies in the Anemias of Infancy and Early Childhood: III, ibid. **8**: 117 (April) 1933. Davidson, L. S. P., and Leitch, I.: The Nutritional Anemias of Man and Animals, Nutrition Abstr. & Rev. **3**: 901 (April) 1934.

2. Josephs, H. W.: The Anemia of Prematurity, Am. J. Dis Child. **48**: 1237 (Dec.) 1934.

HOSPITAL MORBIDITY STATISTICS

The need for morbidity statistics approaching in volume and accuracy those for births and deaths is obvious. The practicability of available methods of accomplishing this object has not yet been widely disseminated. Bolduan [1] has recently revived a suggestion made by him in 1913 showing how the vast mass of hospital morbidity may be employed for statistical study with relative ease.

The method that he proposes can be used no matter what system of nomenclature is employed in such hospitals; as he points out, however, the Standard Classified Nomenclature with the ingenious numerical designations devised by Logie would seem to offer a particularly opportune time for such a statistical inquiry. The basis for the system proposed is the "discharge certificate." These certificates would be supplied to all cooperating hospitals, and for each patient discharged a certificate properly filled out would be sent to a central recording bureau. The certificate contains space in sufficiently condensed form for ordinary data concerning sex, age, race, nationality, social condition, occupation and residence, together with a few comments on the patient's admission, stay in and discharge from the hospital, the disease and its complications. The

1. Bolduan, C. F.: Hospital Morbidity Statistics, Department of Health of the City of New York, No. 5, April 1913; second printing, 1934.

amount of clerical work in filling these certificates would not be large.

At the central recording bureau each certificate should be looked over by a trained physician registrar, who would indicate on each certificate the correct designation under the standard nomenclature. The tabulating clerk may then transfer, by means of punch holes, all the information on each certificate to a correspondingly numbered tabulating card. In this way tables of almost infinite variety may be prepared from the information received.

The value of the resulting data would be manifest in numerous ways. Thus, for example, a tabulation of the cases of inguinal hernia might reveal that in one hospital the average length of stay was twelve days; in another this might be eighteen days. If the results obtained were equally good, a change in methods at the second hospital might enable the latter to reduce its hospital stay for cases of this type. Such analysis might also reveal that there were more patients of a certain type in one hospital than in others, and this in turn might indicate facilities that are not readily available in the other hospitals. Important correlations of certain diseases with race, sex, occupation or other factors might also be revealed.

The expense of such an undertaking, according to Bolduan, is composed of two factors: the preparation of tables, and their analysis and publication. After such work had been organized and running for some time, he estimates that the preparation of tables concerning 200,000 cases would probably not exceed $12,000 per annum, and the printing of an annual report would probably be less than the present total cost of the individual hospital reports. The participating hospitals would have practically no additional expense.

NARCOTIC FARMS—A PUBLIC POLICY

Elsewhere in this issue (on page 574) appear the regulations governing the admission of persons to the federal narcotic farms, the first of which is being established at Lexington, Ky. Addiction to habit-forming drugs is widespread throughout the United States. All classes and groups of the general population are affected by such addiction in one way or another. The geographic distribution of these people corresponds relatively to the geographic distribution and density of the population; occupation, age periods of life, nativity, sex, color, and marital or educational status are not exempting factors. Thus, addiction to narcotic drugs resembles an endemic disease, for it is through and on the people. Based on knowledge available, it is estimated that there are about 100,000 drug addicts in the United States.

Perhaps there is no condition in which man is placed that is fully comparable with that of opium addiction, in which food, shelter, raiment, and all those things "by which men live" are cheerfully abandoned for the drug of choice. Contact and association with others who are addicted to the use of such drugs stand out as the more prominent and frequent immediate causes of addiction. The removal of addicts from American communities is therefore a step in the direction of preventing further addiction.

The authorization and establishment of facilities for the confinement and treatment of persons addicted to habit-forming drugs bears a direct relationship to policies respecting enforcement of antinarcotic laws and the protection of the American community. Problems in penal and correctional procedure, the uses of narcotic drugs in medical practice, research and the quest for more accurate and fundamental knowledge concerning the nature of drug addiction and related phenomena will be studied to better advantage under the conditions prevailing when the new government institutions begin to function. Moreover, these farms are a response to the instinctive demands ever present in the American people that the sick and afflicted shall be set in the way of strength and hope.

Current Comment

SPECIAL RADIO PROGRAM

Under Association News in this issue, on page 568, is another announcement of a special broadcast by the American Medical Association, which has been arranged through the courtesy of the National Broadcasting Company over a coast to coast network. It is announced also in the advertising section. Physicians are requested to call the attention of their patients to this broadcast and also to emphasize that copies of the speeches will be available after the broadcast to all listeners who send a request to the station to which they are listening, to the National Broadcasting Company at either New York or Chicago, or to the American Medical Association. After the broadcast, physicians are requested to express their opinion of the broadcast direct to Mr. Franklin Dunham, National Broadcasting Company, Radio City, New York.

TORNADOES

The excessive heat and scarcity of rain for month after month during 1934 were such absorbing features of the weather that the small number of tornadoes escaped public attention. The United States witnessed during this unusual season only seventy-six tornadoes, while during the season of 1933 its territory was invaded by 260 tornadoes, and in 1932 by 152. In the last fifteen years, only 1919 had as few tornadoes as did 1934. Perhaps the excessive number of lives lost on account of the heat in 1934 was saved by the scarcity of tornadoes. The sixty-five twisters of 1919 killed 205 people, while the seventy-six of 1934 killed only thirty-two. According to the U. S. weather

bureau,[1] the tornado belt consists of Arkansas, Missouri, Iowa, Illinois, and much of Kansas and Nebraska. Other parts of the country may be visited by them, as were New Orleans, Cleveland and Indianapolis recently. Past performance is no index as to where and when the next one will strike. In 1934 the worst tornado occurred at Maryville, Mo., and in 1933 at Nashville. The worst tornado of 1929 hit Minneapolis. In one day, May 1, 1930, there were thirty-two tornadoes in six different states. A toll in human life is often taken by storms accompanied by less violent winds. Indeed, comparatively mild weather in circuitous and indirect ways probably affects the health of more people than do the few violent storms. Unfortunately, but little significant work has yet been done in this interesting field of research.

Medical Economics

NEW DEVELOPMENTS IN BRITISH PLANS

In an address before the Annual Conference of Secretaries of Constituent State Medical Associations in September 1934, Dr. R. G. Leland[1] said in discussing a recent report of a committee of the British Medical Association:

> The previous paragraph indicates that the choice is now between the extension, development and adjustment of the national insurance system to meet the larger problems of medical service and "a salaried state service." Concerning the latter, the report says, "There can be no doubt that the great majority of the profession is strongly opposed to this." It would seem to be a fair interpretation of the entire report to say that, because the "present system of National Health Insurance has become an accepted and valued part of the national life," now only two alternatives are left for the British Medical Association to consider. One of these is the salaried state service and the other an effort to patch up and coordinate the present system of national health insurance with other forms of medical service.

Events in the brief time since this address was delivered indicate that the predicted action is already in sight in spite of the fact "that a great majority of the profession is strongly opposed to this." A cabled report says that several thousand British physicians have formed a trade union and joined the Trade Union Council (corresponding to the A. F. of L. in the United States). This action is taken in order to be prepared for what is now felt to be the early introduction of a universal system of state medicine with salaried physicians.

Alan Moncrieff,[2] London correspondent of the *South African Medical Journal*, gives further information of the progress of this development:

> Placebo prescribing is well recognized as a fault of our present panel insurance system, and there are other faults (as well as many virtues) which are less obvious. It is interesting to note, therefore, that at the recent Conference of the Labor Party at Southport, time was found between discussion on foreign policy and home affairs to receive a report on a proposed State Health Service, which is not based, as many such schemes have in the past been based, upon the national health insurance service. In effect, the panel system would be abolished and all benefits, except cash benefits, taken away. The medical service would be supplied by the local municipal authorities to all under a £500 income basis, and such service would be available both in the homes and in hospitals, for all voluntary hospitals and institutions would be taken over by agreement by the various municipal bodies. The medical services provided would center round well equipped clinics, where all the latest methods of diagnosis and treatment would be available. Panel appointments would gradually be transferred into nonsalable positions in the public health services, which would eventually be on a whole time basis. Much of this may sound utopian at present, but there is a lot of good sense in the suggestions, and it is important that the profession should be fully aware of the possible developments they may expect under the next Labor Government.

1. U. S. Dept. of Agriculture, Clip Sheet 866, released Feb. 3, 1935.
1. Leland, R. G.: Health Insurance in England and Medical Society Plans in the United States, A. M. A. Bull. **29**: 126 (Oct.) 1934.
2. London Letter, South African M. J. **8**: 860 (Nov. 24) 1934.

COMPULSORY HEALTH INSURANCE

The Committee on Public Relations of the Medical Society of the State of Pennsylvania, of which Dr. William H. Mayer of Pittsburgh is chairman, has prepared the following release, which has been sent to more than 2,000 industries in that state:

"There are concerted efforts on foot to socialize the practice of medicine. Should these succeed, general socialization will be under way.

"The Columbia Broadcasting System is broadcasting each week, on Monday evening, over sixty-one stations, discussions dealing with socialization of medicine, which are predominantly propaganda in favor of this socializing effort.

"The American Association for Social Security, Inc., Abraham Epstein of New York City, executive secretary, has prepared a proposed health insurance bill for introduction into the 1935 state legislatures.

"This proposed law shall establish a state health insurance bureau and commission and build up a state health insurance fund from three sources: 1.5 per cent employers' payrolls paid by the employer; 3 per cent of the wages of employees (deducted by employers and transmitted to the state fund), and 1.5 per cent of the total payroll of employers appropriated from tax funds.

"Their model bill also proposes to combine cash benefits with medical, hospital and dental care. This means that the employer will pay his large share directly and bear his burden as an already heavy taxpayer.

"The business interests of Europe have already suffered as a result of this scheme, which in England in 1933 cost through parliamentary grants $24,000,000 and in Germany gave clerical employment to 34,300 persons.

"*Business men and industrialists should not willingly promote socialization of business and industry in America.* If the practice of medicine is socialized, the entering legislative wedge will have been gained.

"Will you not therefore first urge your legislative representatives to discourage the disrupting activities of the 'American Association for Social Security' which is promoting these socialization schemes through active lobbies; second, use your influence with the Columbia Broadcasting Company to prevent the propaganda for the creation of an expensive bureaucracy ultimately destructive of good medical service.

"The Medical Society of the State of Pennsylvania through its Public Relations Committee will be glad to correspond with you further."

Association News

THE ATLANTIC CITY SESSION

Applications for Space in Scientific Exhibit to Close February 25

Attention is called to the fact that applications for space in the Scientific Exhibit at the Atlantic City Session will close on February 25, after which time all applications received will be put on the waiting list.

The Committee on Scientific Exhibit requires that all applicants fill out the regular application blank. Blanks may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

February 21. Heart Muscles.
February 28. Protecting the Heart.
March 7. Headache.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

February 19. Health Lessons from George Washington, W. W. Bauer, M.D.

February 26. Health and Education, Morris Fishbein, M.D.

March 5. Surgery in Diabetics, Leland S. McKittrick, M.D., who will speak from the National Broadcasting Company's studios in Boston, by special arrangement.

Special Coast to Coast Broadcast

The American Medical Association will broadcast on a special program arranged through the courtesy of the National Broadcasting Company over a network of stations, beginning at 6 p. m., eastern standard time, Monday, February 18. The program will include music and three speakers from among physicians in attendance at the Annual Congress on Medical Education and Medical Licensure, meeting in Chicago on that day. The speakers will be introduced by Dr. Morris Fishbein. The speakers and their topics are as follows:

Advancement of Medical Education, Walter L. Bierring, M.D.
The Prolongation of Life, Ray Lyman Wilbur, M.D.
The Battle Against Tuberculosis, Kendall Emerson, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

One State Board Examination a Year.—In the future, only one examination will be held a year for license to practice medicine in Alabama, in accordance with a decision of the state medical board, January 5. Formerly two examinations were held, one in January and one in July; under the new ruling the only examination will begin the last Tuesday in June. Applicants who have been licensed by other states with which Alabama reciprocates may file their applications with the secretary of the board at any time.

ARKANSAS

Bill Introduced.—H. 218, to amend the medical practice act, proposes to authorize the boards of medical examiners, in their discretion, to license without examination diplomates of the National Board of Medical Examiners.

Society News.—Speakers before the Fourth Councilor District Medical Society at Monticello, Dec. 3, 1934, included Drs. Henry T. Smith, McGehee, on "Relation of the Physician to Public Health," and William R. Brooksher, Fort Smith, "Cooperation of the Physician with Organized Medicine."—— At a meeting of the Independence County Medical Society at Batesville, Dec. 10, 1934, Drs. Jesse D. Riley, State Sanatorium, discussed problems of tuberculosis; Van D. McAdams, Cord, burns, and Frank A. Gray, Batesville, pneumonia.

CALIFORNIA

Bills Introduced.—S. 98 proposes to make it unlawful, except for licensed physicians and for persons licensed specifically by the state board of health so to do, to perform diagnostic tests on cultures or material from persons suffering from infectious or contagious diseases. S. 309 proposes that any person convicted of distributing unlawfully narcotic drugs, who is himself not a narcotic addict, may be punished, in addition to the other penalties provided by the act, by from one to twenty lashes at a whipping post. S. 391 proposes to establish a system of compulsory and voluntary health insurance. The bill was introduced only by title, however, and the remainder of the bill is to be inserted by the committee on public health and quarantine, to which this bill has been referred. S. 392 proposes to make it unlawful to conduct a clinical laboratory unless it be under the immediate direction of a licensed clinical laboratory technologist licensed by the state board of health. The state board of health is to license as a clinical laboratory technologist any licensed practitioner of the healing art who has specialized in general clinical laboratory work, such as bacteriology, serology, biochemistry and parasitology, and other allied subjects for at least three years. It is also to license (1) any other person who for more than eight years has been engaged continuously and actively in the work and direction of a clinical laboratory and (2) any other person who can qualify by written and practical examinations to be given by the board. The provisions of the bill, however, are not to apply to any licensed physician maintaining a laboratory in his own office for use in his own practice. S. 413 prohibits the employment of pharmacists and pharmacy clerks for more than an average of six hours a day, for more than seventy-two hours in any two consecutive weeks, or for more than twelve days in any two consecutive weeks. A. 416, to amend the workmen's compensation act, proposes to permit chiropractors to render the "medical" care to injured workmen for which the act makes the employer liable. A. 551, to amend the laws regulating the operation of maternity hospitals, proposes to make it unlawful for any such hospital to offer, as an inducement to a woman to enter therein, to dispose of her child or children for adoption. A. 603, to amend the law relating to county hospitals, proposes to require the admittance of any expectant mother, unable to pay for the necessary care, to any county hospital, regardless of her length of residence in the county. A. 761, to amend the retail sales tax act of 1933, proposes to exempt from its provisions the gross receipts from the sale of medicine and medical supplies. A. 890, to amend the provisions of the medical practice act with respect to chiropody, proposes (1) to make the words "chiropody" and "podiatry" synonymous and (2) to define "mechanical treatment," which chiropodists are authorized to employ, as the employment of appliances to the plantar or lateral surfaces of the foot or feet, or of pads, or the use of adhesive tape strappings, or any forcible means for the correction or treatment of any deformity of the foot or feet but does not permit the treatment of fractures of the bones of the foot or feet or the application of splints or casts; provided, however, that the manufacture, the recommendation or the sale of corrective shoes or appliances for the human feet shall not be considered as mechanical treatment. A. 1037 proposes to make it unlawful for any person to own, possess or operate any x-ray device or x-ray laboratory unless such device or such laboratory is operated under the direct supervision of a person licensed by the state board of health. Apparently only licentiates of the board of medical examiners, licensed osteopaths and licensed dentists are to be eligible for licensure by the board of health. Such practitioners are to be permitted to possess and use such devices "as are incident to the treatment of patients by means other than x-ray or x-ray devices."

COLORADO

Special Meeting of House of Delegates.—Members of the Colorado State Medical Society were cautioned against advocating policies of legislation not officially sanctioned by the committee on public policy in a resolution adopted at a special meeting of the house of delegates, January 16. The meeting was devoted to a consideration of legislation as it affected the medical profession.

Resolution About Sewage Disposal Plants.—The Crowley County Medical Society unanimously adopted a resolution, Dec. 8, 1934, which recommended the construction of sewage disposal plants in communities that dump their sewage into streams used for irrigation. The resolution pointed out that Colorado is rapidly losing its reputation as a health center because of the prevalence of intestinal diseases attributed to the irrigation of vegetables with sewage water.

CONNECTICUT

Bills Introduced.—H. 543 proposes to authorize the governor to appoint a commission of five members to investigate the subject of health insurance and to report its findings to the next session of the general assembly. H. 631, to amend the medical practice act, proposes that the Connecticut Medical Society and the Connecticut Homeopathic Medical Society shall file annually with the governor the name of one physician whom each society recommends for membership on the medical examining board (thus denying this privilege, which the law now accords, to the Connecticut Eclectic Medical Society). H. 1064, to amend the workmen's compensation act, proposes to permit chiropractors to render the "medical" care to an injured employee for which an employer must pay.

DELAWARE

Bill Introduced.—S. 37 proposes to make it the duty of physicians, midwives or other persons in attendance at childbirth to use either a 1 per cent solution of silver nitrate, a 10 per cent solution of argyrol, or a 1 per cent solution of protargol, or their therapeutic equivalent, as a prophylactic against inflammation of the eyes of the new-born, and to make a record of the prophylactic used and to endorse the details thereof on every birth certificate.

DISTRICT OF COLUMBIA

Dr. **Ruhland Appointed Health Officer.**—Dr. George C. Ruhland, health commissioner of Syracuse, N. Y., has accepted appointment as health commissioner of the District of Columbia, succeeding Dr. William C. Fowler, retired. The appointment was confirmed, February 7. Dr. Ruhland graduated in 1904 from the Wisconsin College of Physicians and Surgeons. In 1924 he resigned as health commissioner of Milwaukee to accept the Syracuse appointment.

Medical Bills in Congress.—S. 1737, introduced by Senator Frazier, North Dakota, proposes to prohibit experiments and operations on living dogs in the District of Columbia for any purpose other than the healing or curing of the dog. S. 31 and H. R. 4996 have been reported to the Senate and House, respectively, providing for the issuance of a license to practice the healing art in the District of Columbia to Dr. Chester C. Groff (S. Rept. 75; H. Rept. 87). H. R. 3451, intoduced (by request) by Repesentative Norton, New Jersey, proposes to amend the law of the District of Columbia relating to lunacy proceedings.

GEORGIA

Bills Introduced.—H. 230 proposes to amend those provisions of the medical practice act which require an applicant for a license to be a graduate of a legally incorporated medical college in good standing with the board by permitting graduates "of one of the two colleges of medicine now existing in the state of Georgia" also to qualify. H. 291 proposes to permit hospitals, without complying with the insurance laws of the state, to "offer to the public hospitalization in consideration of a stipulated amount of money collected weekly or monthly in advance." H. 331 proposes to grant to hospitals, treating persons injured through the fault of others, liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons because of their injuries.

IDAHO

Bills Introduced.—H. 70 proposes to repeal the laws regulating the possession and distribution of narcotic drugs and to enact what the draftsman of this bill cites as the "uniform narcotic drug act." The bill, however, differs from the model uniform narcotic drug act in some important particulars. It omits the provisions in the model bill intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty-eight hours. H. 72, to supplement the pharmacy practice act, proposes a list of drugs, which it denominates as poisons. The bill proposes to make it unlawful for any one to sell any drug so listed without first ascertaining that the purchaser is aware of the poisonous character of the drug and that it is desired for a lawful purpose, without labeling on the container the word "poison" and the name and place of business of the dispenser. It proposes also to make the sale of such a drug unlawful to a minor under 16 years of age without the written order of an adult, and, in the case of certain drugs, to require that the vender record in a book kept for that purpose the name of the drug sold, the intended use thereof, the date of delivery, the name and address of the purchaser and the name of the dispenser. The provisions of the bill, however, are not to apply to drugs dispensed in accordance with written prescriptions of licensed physicians, dentists or veterinarians.

ILLINOIS

Bill Introduced.—H. 191 proposes to require a male applicant for a license to wed to present a certificate from a licensed physician that the applicant is free from venereal disease.

Another Credit Bureau.—The Medical Credit Bureau was recently organized by the Peoria City Medical Society to furnish members with the financial rating of patients. Under the plan, "all worthy individuals will receive medical care as heretofore, but the person or persons having the means but not the desire to remunerate the physicians for services rendered will be asked to receive medical care and attention from the proper municipal, state or federal agencies created for that purpose."

Chicago

Dr. Flexner to Give Pasteur Lecture.—Dr. Simon Flexner of the Rockefeller Institute for Medical Research, New York, will present the thirteenth Pasteur Lecture of the Institute of Medicine of Chicago at the Chicago Woman's Club, April 26. His subject will be "Virus Diseases of the Central Nervous System: Their Extent and Mode of Infection."

Symposium on Tuberculosis.—The Chicago Medical Society will devote its meeting, February 20, to a symposium on tuberculosis. The following physicians will participate:

Jay Arthur Myers, professor of medicine and preventive medicine and public health, University of Minnesota Medical School, Minneapolis, Tuberculosis Among Nurses and Physicians.
Kendall Emerson, managing director, National Tuberculosis Association, New York, Public Campaign Against Tuberculosis.
Harry J. Corper, director, research laboratories, National Jewish Hospital, Denver, Recent Research on Tuberculosis.
Benjamin Goldberg, associate professor of medicine, University of Illinois College of Medicine, Cavities and Collapse Therapy.

Conference on Occupational Disease.—The Illinois Manufacturers' Association sponsored a technical discussion on occupational disease from the medical point of view at the Congress Hotel, January 31. The speakers included the following:

Dr. Leroy U. Gardner, director, Saranac Laboratory, Saranac Lake, N. Y., Pathology of Silicosis.
Donald E. Cummings, assistant director of the laboratory, Etiology, Clinical Findings and Prevention of Silicosis.
Homer L. Sampson, Sc.D., director, x-ray laboratory, Trudeau Sanatorium, Saranac Lake, Roentgen Findings.

A conference was held in the evening, at which speakers were:

F. Robertson Jones, New York, general manager, Association of Casualty and Surety Executives, Problems of Compensation in Occupational Diseases.
Peter J. Angsten, chairman, Illinois Industrial Commission, Occupational Diseases and the Industrial Commission.
Dr. Clarence O. Sappington, consulting industrial hygienist, Some Medicolegal Phases of Occupational Diseases.

IOWA

Bill Introduced.—H. 78 proposes that before any applicant for a license to practice medicine, osteopathy, osteopathy and surgery, or chiropractic may be examined by his professional board, he must pass an examination to be given by an impartial basic science examining board in anatomy, physiology, chemistry, pathology, bacteriology and hygiene. This board is to consist of five members of the faculties of the state university, the State College of Agriculture and Mechanic Arts, the Iowa State Teachers College and any other university or college accredited by the Iowa State Board of Educational Examiners. All members of the board must be learned in the basic sciences, and no member may be licensed to practice any of the healing arts.

KANSAS

University News.—A graduate of the University of Kansas who wishes to remain anonymous has contributed $60,000 to be used for a children's clinic. Members of the faculty are now working on plans for the new structure.

Bills Introduced.—H. 275 proposes to authorize Fort Hays Kansas State College to provide local and traveling clinics and adequate psychologic clinical facilities for unusual or abnormal children of school age. H. 301 authorizes the formation of community hospital districts and the erection of community hospitals. In the management of such hospitals, no discrimination is to be made against practitioners of any school of medicine or healing recognized by the laws of Kansas and all such legal practitioners are to have equal privileges in treating patients in said hospitals.

Society News.—Drs. Horace W. Carle and Charles Greenberg, St. Joseph, Mo., presented papers on "Hypoglycemia" and "Transurethral Prostatectomy," respectively, before the Atchison County Medical Society, Dec. 4, 1934, in Atchison. ——Dr. Harry W. King, Kansas City, addressed the Wyandotte County Medical Society, January 23, on "Carcinoma of the Sigmoid Colon," and Dr. John H. Ogilvie, Kansas City, Mo., presented a case of "Traumatic Suppurative Lymphadenitis of the Left Inguinal Region with Sinus Formation to the Left Sacro-Iliac Joint."——At a meeting of the Rush-Ness County Medical Society, recently, Dr. Vern L. Pauley, Wichita, discussed transurethral prostatic resection, and Dr. Clyde D. Blake, Hays, the function of the state medical society.—— Dr. Noble P. Sherwood, Lawrence, addressed the Shawnee County Medical Society at Topeka, January 7, on "Hypersensitiveness and Immunity to Tuberculosis."

MAINE

Bills Introduced.—S. 241, to amend the medical practice act, proposes to add to the grounds for which a physician's license may be revoked: (1) conviction of any crime involving moral turpitude or of any crime in the practice of his profession; (2) immoral or dishonorable conduct or fraudulent or unprofessional conduct in the practice of his profession; (3) habitual intemperance in the use of liquor or narcotics; (4) use of deceptive, misleading, extravagant, improbable or unethical advertising. S. 198 proposes to repeal the laws regulating the possession and distribution of narcotic drugs and to enact what apparently is the uniform narcotic drug act.

MARYLAND

Bill Introduced.—H. 70 proposes to repeal the laws regulating the possession and distribution of narcotic drugs and to enact what the draftsman of this bill cites as the "uniform narcotic drug act." The bill, however, differs from the model uniform narcotic drug act in some important particulars. It omits the provisions in the model bill intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty-eight hours.

MASSACHUSETTS

Bill Introduced.—H. 1267 proposes to grant liens to physicians and hospitals, treating persons injured through the negligence of others, on all claims, rights of action, judgments, compromises or settlements accruing to the injured persons by reason of their injuries.

Portrait of Dr. Warren.—A portrait of Dr. John Warren, the first professor appointed in Harvard Medical School, Boston, was recently presented to the school in memory of Dr. Henry Lyman, who died June 15, 1934. The presentation was made by Major Gen. Robert U. Patterson, surgeon general, U. S. Army, and was accepted by the dean, Dr. David L. Edsall. The portrait, which hangs in the school library, was given by the officers of the former U. S. Army Base Hospital number 5, with which Dr. Lyman served during the World War. Dr. Lyman graduated from Harvard in 1912. Interested particularly in biologic chemistry, he was connected for many years with the Collis P. Huntington Memorial Hospital. With the rank of major, he commanded base hospital number 5 part of the time, it was stated, when that unit was in active service as part of the American Expeditionary Forces.

MINNESOTA

Personal.—Dr. Benjamin F. Smith, superintendent of the Willmar State Asylum since 1927, was appointed to take charge of the Rochester State Hospital by the Minnesota Board of Control, effective January 1; he succeeds the late Dr. Arthur F. Kilbourne.

Dr. Cutler Gives Judd Lecture.—Dr. Elliott C. Cutler, Moseley professor of surgery, Harvard University Medical School, will give the second lecture in the annual Judd Lectureship in Surgery at the University of Minnesota, Minneapolis, February 19. His subject will be "Total Thyroidectomy for Heart Disease." Dr. Edward Starr Judd, Rochester, who endowed this lecture, graduated from Minnesota in 1902.

The Jackson Lecture.—Dr. Logan Clendening, professor of clinical medicine, University of Kansas, will deliver the second Clarence Martin Jackson lecture of the University of Minnesota School of Medicine, February 20. His subject will be "The Human Side of Medicine." The lecture was established by Xi chapter of Phi Beta Pi Medical Fraternity in honor of Dr. Jackson, professor of anatomy at Minnesota. The first lecture was given by Dr. Walter L. Bierring, Des Moines, Iowa, President, American Medical Association, on "The Temporal Sequence of Medical Events."

MISSISSIPPI

Premedical Work Required for License.—The Mississippi State Board of Health passed a regulation, Dec. 31, 1934, requiring that all applicants who are accepted for examination for medical license in Mississippi must have completed two years' premedical work before entering the study of medicine.

Society News.—At the fourth quarterly meeting of the Northeast Mississippi Thirteen Counties Medical Society at Tupelo, Dec. 18, 1934, the speakers were Drs. Douglas D. Baugh, Houston, on "The Recognition of the More Common Mental Disorders"; George A. Hendon, Louisville, Ky., "Treatment of Peptic Ulcer by Venoclysis"; Felix J. Underwood, Jackson, executive officer, state board of health, "Our Mutual Interest," and Albert G. Leroy, Booneville, "Eclampsia"—— Dr. Douglas D. Baugh, Houston, discussed leukemia before the Pontotoc County Medical Society, Dec. 4, 1934.

MISSOURI

Election of Board Officers.—Dr. Timothy S. Bourke, Kansas City, was elected president of the Missouri State Board of Health in Jefferson City, January 21, succeeding Dr. Emmett P. North, St. Louis. Dr. William T. Elam, St. Joseph, was elected vice president, succeeding Dr. Peter T. Bohan, Kansas City, and Dr. Elmer T. McGaugh, Jefferson City, was reelected secretary.

Society News.—The department of obstetrics and gynecology of St. Louis University School of Medicine presented the following program before the St. Louis Medical Society, January 22: Drs. Laurence M. Riordan and William D. Collier spoke on "Differential Diagnosis of Right Sided Abdominal Pain" and "Pathology of Myxomatous Placenta," respectively. Case reports were presented by Drs. Paul R. Fletcher on "Hydrocephalic Fetus, with Remarks on Treatment"; Percy H. Swahlen, "Myxomatous Placenta," and William H. Vogt, "Advanced Extra-Uterine Pregnancy."

Director of Child Guidance Clinic Appointed.—The appointment of Dr. Edmond F. Sassin, assistant in neurology and psychiatry, St. Louis University School of Medicine, St. Louis, as director of the Psychiatric Child Guidance Clinic at St. Louis has been announced. Dr. William L. Nelson, the former director, has held the position since the clinic was founded eleven years ago. It was reported that the change is a part of reorganization plans now under way in the department of public welfare. These plans call for the erection of a psychiatric hospital, of which it is hoped the clinic will eventually be made a unit. Dr. Sassin graduated from St. Louis University School of Medicine in 1927.

MONTANA

Bills Introduced.—S. 53, to amend the law prohibiting the production, distribution or possession of marijuana, proposes to make a violation of the act a felony, punishable by imprisonment in the penitentiary for from one to five years and/or a fine of from $500 to $1,000. H. 120, to enact a new osteopathic practice act, proposes to define osteopathy as "that system of the healing art or school of medicine which in its theory places chief emphasis as health factors upon the structural integrity and natural immunity of the body, and in its practice upon the adjustment of structural irregularities, and the normalization of functional activity through manipulation." The bill proposes to authorize the osteopathic examining board to license as an osteopathic surgeon any osteopath who has completed two years of at least nine months each of postgraduate instruction in surgery in a recognized and regularly conducted college, or who presents evidence of having completed a one year postgraduate course of at least nine months in surgery in a recognized college, or an internship in a hospital under such college supervision and a one year course of training of at least nine months as a surgical assistant in a hospital having at least twenty-five beds and equipped for major surgical work. This bill omits the specific prohibition contained in the present law against osteopaths prescribing or using drugs and in its stead purports to authorize an osteopath "to practice his profession as taught in recognized and regularly conducted colleges of osteopathy." Osteopaths who are licensed to practice surgery by the osteopathic board are specifically granted unlimited surgical rights.

NEBRASKA

Bill Introduced.—H. 263 proposes to make it the duty of every physician to respond to any call to assist in the delivery of a child, when he is the nearest available practitioner. Any practitioner violating the provisions of this bill is to be punishable by a fine of from $25 to $200.

NEW HAMPSHIRE

Bills Introduced.—H. 150 proposes a new workmen's compensation act. Compensation is to be granted for injury or death caused by accident arising out of and in the course of the employment but not for disease or death from disease, unless it is the direct result of an accident, except anthrax, lead poisoning, silicosis or disease due to inhalation of poisonous gases or fumes. During the first four weeks of the injured worker's disability, the employer is to furnish reasonable medical, surgical and hospital services and supplies, and other necessary remedial care. In the discretion of the industrial accident board the employer may be required to furnish

such care for a longer period. H. 275, to amend the pharmacy practice act, proposes (1) to prohibit persons, other than physicians and registered pharmacists, from selling or otherwise distributing articles, substances and compounds commonly used or capable of being used as contraceptives or abortifacients, and (2) to make the act applicable to the sale of proprietary medicines containing barbital or other compounds of the barbituric acid series.

NEW JERSEY

Bills Introduced.—S. 140 proposes to authorize the municipalities that do not maintain municipal hospitals to appropriate not exceeding 0.1 per cent of the total assessed valuation of real and personal property of such municipality to any hospital located in such municipality, which treats indigent residents without cost. A. 89 authorizes the state department of health to care for, treat, isolate and maintain indigent disease carriers.

Society News.—Dr. Rosco G. Leland, Chicago, director, Bureau of Medical Economics, American Medical Association, addressed the Essex County Medical Society, Newark, January 10, on "Compulsory Health Insurance as It Affects Members of the Medical Profession."——Dr. Harlow Brooks, New York, addressed the Bergen County Medical Society, Hackensack, January 8, on "Diseases of the Liver," and Dr. Arcangelo Liva, "Oculist versus Optometrist."—— Dr. Nathan B. Van Etten, New York, made an address before the Hudson County Medical Society, Jersey City, January 2, entitled "How Shall the Sick Be Adequately Served and How Shall the Servants of the Sick Be Adequately Paid?"——A symposium on rheumatic fever was presented before the Camden County Medical Society, Camden, January 8, by Drs. Harold K. Eynon, William T. Read Jr., B. Franklin Buzby, Harold D. Barnshaw and Ernest Reed Hirst.——Dr. Lewis K. Ferguson, Philadelphia, addressed the Gloucester County Medical Society, Pitman, Nov. 15, 1934, on varicose veins.

NEW YORK

Botulism from Imported Canned Sprats.—Three cases of botulism with one death were recently reported from Westchester County. The three victims had eaten a can of imported Kiel sprats, although they noticed that the can was bulging before it was opened, that gas escaped and that the fish tasted sour. One man ate for supper twelve fish, another six and a woman three. The illness began the next morning; the man who had eaten most became rapidly worse and died the following morning. Necropsy confirmed the diagnosis. Botulinus serum was obtained from the state laboratory in New York for the other two patients. The man who had eaten six fish was desperately ill for a time, it was said, but was improving at the time the report was published. The woman never showed serious symptoms. The spoiled fish was traced to a pedler, who said that he had bought fifteen cans from an importer and sold some to other pedlers. A technical charge of homicide was placed against him by the county medical examiner. Federal officials embargoed the stock of the importer and the New York City Department of Health was reported to be investigating one pedler known to be operating in the city.

Bills Introduced.—S. 474 and S. 718 propose a system of compulsory and voluntary health insurance. The benefits proposed consist of cash and all forms of medical and dental services. Persons employed at "other than manual labor receiving wages in excess of $250 monthly," farm laborers, and persons employed by an employer having less than three employees in personal or domestic services, are excluded from the compulsory insurance of the bill but are entitled to participate in its voluntary insurance. S. 505 proposes to create in the department of mental hygiene a board of psychiatric examiners to license as qualified psychiatrists all applicants who (1) have been licensed to practice medicine for at least five years and have had five years' experience in actual practice, and (2) have had three years' full time practice in the care and treatment of persons suffering from mental diseases or mental defects in certain approved institutions or have devoted five years to a practice confined wholly or substantially to the care and treatment of persons suffering from nervous or mental defects. S. 589 proposes to create in the education department a state board of electrologists and to regulate the practice of electrolysis. Electrolysis is defined by the bill as "the method used for the permanent removal of superfluous hair by means of a controlled electric current introduced into the hair follicle by way of a fine metallic needle which is directed into the hair papilla where a chemical decomposition takes place destroying the life of the hair forever." Licenses are to be issued, after examination, to persons who are high school graduates and have completed a course of training of not less than six months in schools of electrolysis approved by the board. A. 644, to amend the workmen's compensation act, proposes to make compensable all occupational diseases arising out of and in the course of any employment covered by the act. A. 765 proposes to make it unlawful for any person, not a licensed physician or surgeon, to broadcast any surgical or medical advice.

New York City

Annual Art Exhibit.—The New York Physicians' Art Club will hold its eighth annual exhibition at the New York Academy of Medicine during the two weeks beginning March 30. Members, who pay no dues but a fee for their exhibits, are principally New Yorkers, but any physician may send original art work to the exhibit, it is announced. Officers are Drs. Howard Lilienthal, president; Winfred Morgan Hartshorn, treasurer, and Louis C. Schroeder, secretary. All communications should be addressed to Dr. Schroeder at 50 East Seventy-Second Street.

Council to Coordinate Hospitals.—The Hospital Council of New York, representing the five county medical societies, philanthropic and welfare agencies and the city government, was organized by Mayor La Guardia at a meeting, January 18, at the city hall. With the increased overcrowding in city institutions and decreased support for private hospitals, the hospital problem has grown acute. It will be the council's task to define the city's needs, to explain the situation to the public in the hope of calling out latent resources of private philanthropy and of combining private and public resources in the most effective manner, the mayor said. Those who attended the meeting were:

New York Academy of Medicine, Drs. John A. Hartwell and Bernard Sachs.
Medical Society of the County of Queens, Drs. Charles F. Miller, Corona, and Howard W. Neil, Jamaica.
Medical Society of the County of New York, Dr. Franklin Welker.
Medical Society of the County of Kings, Drs. John S. Read and Alec N. Thomson, Brooklyn.
Richmond County Medical Society, Drs. Arthur S. Driscoll and William C. Buntin, Staten Island.
Bronx County Medical Society, Drs. Milton J. Goodfriend and David J. Kaliski.
Federation for Support of Jewish Philanthropic Societies, Solomon Lowenstein and Frederick M. Stein.
Brooklyn Federation of Jewish Charities, Joseph J. Schwartz and Joseph J. Baker.
Controller of the City of New York, Frank J. Taylor and G. Harry Lynn.
Health Department, Drs. John L. Rice and Herbert R. Edwards.
Catholic Charities of New York, Rev. Joseph S. O'Connell.
Catholic Charities of Brooklyn, Mgr. Jerome Reddy and Father Brophy.
United Hospital Fund, David H. McAlpin Pyle and Homer Wickenden.
Welfare Council, Charles C. Burlingham, Miss Jane Hoey and Robert P. Lane.
Commissioner of Hospitals, Dr. Sigismund S. Goldwater.

NORTH CAROLINA

Bills Introduced.—S. 80 proposes to make it the duty of the parents or guardians of all children born in the state to have them immunized between the ages of 6 and 12 months with diphtheria toxoid. H. 148 proposes to grant to physicians and hospitals, treating persons injured through the negligence of others, liens on all sums recovered as damages by the injured persons by reason of their injuries.

NORTH DAKOTA

Bill Introduced.—S. 75 proposes to grant to hospitals, supported in whole or in part by private charities and treating persons injured through the negligence of others, liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons because of their injuries.

OHIO

Society News.—Drs. Walter M. Simpson and Arthur M. Culler addressed the Montgomery County Medical Society, Dayton, January 4, on "Progress in Artificial Fever Therapy Research" and "Artificial Fever Therapy of Ocular Syphilis," respectively.——Dr. Dean D. Lewis, Baltimore, addressed the Cincinnati Academy of Medicine, January 7, on "Cystic Mastitis: Its Cause and Treatment."

Founder's Day Clinics.—Ohio State University College of Medicine, Columbus, will present its annual Founder's Day Clinics, March 1-2. Dr. Russell H. Oppenheimer, dean of Emory University School of Medicine, Atlanta, will address the alumni on "The Doctor's Place in Modern Economic and Social Life," Saturday morning, March 2. There will be clinics at Children's, St. Francis and University hospitals, and tours of the medical buildings of the university. Special fea-

tures will be a session devoted to normal and pathologic reactions of the glands of internal secretion and a symposium on cardiology. In the evening March 1, Dr. Edward D. Churchill, John Homans professor of surgery, Harvard University Medical School, Boston, will deliver the Alpha Omega Alpha address, on "Lobectomy and Total Pneumonectomy." Dr. Russel G. Means is chairman of the committee in charge of the reunion. Class luncheons will be held at noon Saturday and fraternity banquets Saturday evening.

OREGON

Bills Introduced.—H. 180 proposes to limit the distribution of appliances, drugs or medicinal preparations intended or having special utility for the prevention of conception and/or venereal diseases, to licensed physicians and to persons licensed to do so by the state board of pharmacy. H. 208 proposes to prohibit the distribution of amytal, luminal, veronal, barbital, acid diethylbarbituric, or any preparation or compound containing any of the foregoing substances, except on the prescription of a licensed physician, dentist or veterinary surgeon.

Bills Passed.—H. 107 has passed the house, proposing to repeal the laws regulating the possession and distribution of narcotic drugs and to enact what the draftsman of the bill cites as the "uniform narcotic drug act." This bill, however, differs from the model uniform narcotic drug act in some important particulars. It omits the provisions in the model bill intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty-eight hours. S. 82, to enact a new pharmacy practice act, has passed the senate. In its present form, this bill seems to prohibit physicians from dispensing drugs, merely permitting them to administer drugs and medicines personally in order to supply the immediate needs of their patients.

PENNSYLVANIA

Hospital Appointments.—Dr. Enoch H. Adams, Berwick, has been appointed surgeon in chief to the Center County Hospital, Bellefonte.——Dr. William F. Herbst has been chosen chief of the medical department of Allentown Hospital to succeed the late Dr. Joseph M. Weaver.——Dr. Joseph F. Connor, Meadville, who was recently appointed chief surgeon of the Erie Railroad, has also been made chief surgeon of Spencer Hospital, Meadville.

Bills Introduced.—H. 404, to amend the workmen's compensation act, proposes to make compensable any occupational disease acquired in any employment covered by the act. H. 417, to amend the workmen's compensation act, proposes to require an employer within thirty days after the beginning of the disability of an employee due to an occupational disease contracted in the course of the employment to report the case to the department of labor and industry. S. 78, to amend the workmen's compensation act, proposes to make compensable certain occupational diseases, including poisoning by lead, mercury, phosphorus, arsenic, methanol, carbon bisulphide, naphtha, manganese dioxide, brass, zinc, benzol and nitro- and amido-derivatives of benzol; also compressed air illness, radium or x-ray burns, chrome ulceration, cancer or ulcers resulting from tar, pitch, bitumen, mineral oil or paraffin, and infection or inflammation of the skin resulting from contact with oils, cutting compounds, lubricants, dusts, liquids, fumes, gases or vapors; also anthrax, silicosis and chronic miners' asthma. S. 83 and H. 413, to amend the workmen's compensation act, propose that the bills of physicians or hospitals, for which the employer is liable under the act, be presented to a referee designated by the workmen's compensation board of the bureau of workmen's compensation of the department of labor and industry. This referee is to award remuneration so far as possible in accordance with a table agreed on by the Medical Society of the State of Pennsylvania and by the Pennsylvania State Hospital Association and approved by the board. H. 297 proposes to create a board of chiropody examiners and to regulate the practice of chiropody. H. 379, to amend the workmen's compensation act, proposes to extend from thirty days to six months the period following an industrial injury during which the employer must provide medical treatment to an injured employee. The present law limits the employer's liability for such services to $100. The proposed liability under this bill is unlimited.

Philadelphia

Graduate Seminars.—The group of graduate seminars sponsored by the Philadelphia County Medical Society for February is concerned with recent developments in the biology of growth and development and indications for their use in man. John S. Nicholas, Ph.D., associate professor of comparative anatomy on the Bronson Foundation, Yale University, New Haven, Conn., delivered the first lecture, February 1, on "The Contributions of Experimental Embryology to Problems of Mammalian Growth and Development." Others to follow are:

Conway Zirkle, Ph.D., associate professor of botany, University of Pennsylvania, Genetics—Mechanisms of Inheritance—the Hereditary Basis of Diseases—Artificial Control of Inheritance.

Ezra Allen, Ph.D., New York, The Nature and Functional Basis of Sex—Experimental Effects of Sex Development and Reversal in Animals as Possible Explanation of Certain Human Sex Problems.

Dr. Stanley P. Reimann, Lankenau Hospital Research Institute, Application of Some Newly Discovered Effects in Malformation and Tumor Formation in Man and Their Relations to the Subjects Previously Discussed.

Society News.—The College of Physicians of Philadelphia held a dinner, Dec. 15, 1934, celebrating the twenty-fifth anniversary of the occupancy of the college building. Dr. William J. Taylor was toastmaster, and speakers were Drs. Edward B. Krumbhaar, David Riesman, George E. de Schweinitz and Alfred Stengel. The college recently adopted a resolution urging the transfer of the Philadelphia Hospital for Mental Diseases at Byberry to the state in order to relieve overcrowding.——Speakers at a meeting of the Philadelphia Academy of Surgery, January 14, were Drs. J. Stewart Rodman and William G. Leaman Jr., on "Surgical Risks with Special Reference to the Cardiovascular System"; John Einan, "Evaluation of Metabolic Diseases as Surgical Risks"; Joshua E. Sweet, New York, "How Does a General Surgical Procedure Affect the Physiology of the Lung?" and Leonard G. Rowntree, "Evaluation of the Renal Factor in Surgical Risks."——Dr. John M. Fisher has been elected president of the Physicians' Aid Association of the Philadelphia County Medical Society, and Dr. Francis Heed Adler, secretary.

RHODE ISLAND

Society News.—Dr. George Blumer, New Haven, Conn., addressed the Providence Medical Association, Dec. 3, 1934, on "Importance of Observation and Induction in Diagnosis, with Some Remarks on Errors in Diagnosis."——Among others, Dr. Harmon P. B. Jordan and W. Henry Rivard, Phar.D., dean of Rhode Island College of Pharmacy, Providence, addressed the quarterly meeting of the Rhode Island Medical Society, Dec. 6, 1934, on "Current Trends in Pharmaceutical Education."——Drs. Meyer Saklad and Eric P. Stone, Providence, addressed the Washington County Medical Society, January 9, on advances in anesthesia and on birth control, respectively.

Bills Introduced.—S. 52 proposes to grant to physicians, nurses and hospitals, treating persons injured through the negligence of others, liens on all judgments, settlements or compromises accruing to the injured persons because of their injuries. H. 587 proposes to make it the duty of any person in possession of land on which he believes cannabis sativa to be growing to notify the state narcotic board forthwith of that fact. The narcotic board is then to inspect this property and to destroy any cannabis plants that may be found there. The narcotic board is further to be authorized to make surveys to ascertain the extent to which cannabis sativa or cannabis americana is prevalent in the state.

SOUTH DAKOTA

Immunization Campaign.—Eighteen hundred children were immunized against diphtheria in a campaign initiated and carried out by physicians of Sioux Falls recently. The campaign ran two and a half weeks. Treatments were given in the physicians' offices, free to those who could not pay and at fees ranging from 50 cents to $4 for those who could. Liberal publicity was obtained for the project through cooperation of civic clubs, schools, churches, radio, newspapers and theaters.

Sioux Valley Meeting.—The annual session of the Sioux Valley Medical Association was held in Sioux Falls, January 22-23, at the Cataract Hotel. Speakers included:

Dr. Oliver S. Ormsby, Chicago, Some Mycotic Infections of the Skin and Contact Dermatitis.

Dr. Fredrick A. Willius, Rochester, Minn., Factors Concerned in the Diagnosis of Heart Disease.

Dr. Ralph Hess Kunstadter, Chicago, Diagnosis and Treatment of Endocrine Disorders of Children.

Dr. Herman L. Kretschmer, Chicago, Present-Day Views on Treatment of Prostatic Obstruction.

Dr. Louis A. Buie, Rochester, Minn., Proctologic Problems of the Surgeon and the General Practitioner.

Dr. Wallace H. Cole, St. Paul, Principles in the Modern Treatment of Fractures and Their Development and Historical Survey.

Dr. Edward W. Rowe, Lincoln, Neb., Principles of Irradiation.

Dr. Joseph C. Ohlmacher, Vermillion, Pathology of Cancer.

This society includes physicians of the territory adjacent to the intersection of the states of Iowa, South Dakota, Minnesota and Nebraska.

TENNESSEE

Bill Introduced.—H. 408 proposes to require each coroner to appoint as a deputy a licensed physician, whose duty it shall be to ascertain the cause of death of persons who die without medical attention.

TEXAS

Bill Introduced.—H. 334 proposes to require every insurance company doing business in the state to pay a tax of 0.5 per cent of its gross receipts, to be placed in a fund to be known as "the rural and county health fund."

Texas Forty-Fifth in Health Appropriations.—The Texas State Medical Association is cooperating with the state board of health in a campaign for increased appropriations by the legislature for public health work in Texas. The campaign was opened at a meeting in Dallas under the auspices of the state board of health, of which Dr. Charles M. Rosser, Dallas, is chairman, to awaken public concern and focus opinion on the state's health problems. Dr. Samuel E. Thompson, Kerrville, president of the state medical association, made an address on "The Responsibility of the Medical Profession to Public Health"; Dr. Holman Taylor, Fort Worth, association secretary, on the interdependent relation of the medical profession and the public; Dr. John W. Brown, Austin, state health officer, emergency issues confronting public health in Texas, and Dr. Knox E. Miller of the U. S. Public Health Service, the health situation in Texas. Similar meetings have been held in various districts throughout the state in an effort to bring this situation to the attention of the public and thereby to the legislature. It was said that Texas is forty-fifth among the states in its appropriations for public health.

UTAH

Bill Introduced.—H. 82 proposes to forbid any hospital exempted from taxation from discriminating against practitioners of any school of medicine recognized by the laws of the state and to require such hospitals to grant all such practitioners equal rights in treating patients therein. Patients in such hospitals are to have the absolute right to employ at their own expense physicians of their own choice.

WASHINGTON

Bill Introduced.—H. 178 proposes to repeal the basic science act and to enact in its stead an emasculated basic science bill. The examining committee in the basic sciences is to consist of one nonsectarian practitioner, one osteopath, one osteopathic surgeon, one chiropractor, and one other practitioner of a system of drugless healing. The questions to be propounded in examinations and the grading of each applicant's answers must be approved by a majority of the committee. The bill proposes also to lower the passing grade from 75 per cent to 60 per cent.

WEST VIRGINIA

Hospital Contract Practice Condemned.—The council of the West Virginia Medical Association at a special meeting, January 17, adopted a resolution forbidding any of its members to practice "under the terms of or in connection with any hospital list contract which provides for the care or treatment of industrial injuries" or to "be on the staff of or in any way connected with any hospital which is a party to any such list contract." The ruling is to take effect April 17 and after that date the council is to ascertain whether any members are engaging in this kind of practice and recommend to the county societies concerned that these men's membership be terminated immediately. If the county society does not comply with this ruling, the charter of the society is to be withdrawn. The council explained that it is believed that physicians wish to abolish this type of practice but that it is difficult for any individual or group to avoid it if others are still engaging in it.

WISCONSIN

Bill Introduced.—A. 88 proposes to make it unlawful for any representative of a relief agency, any employer or his agent, or any insurance company or its agent, to influence or to attempt to influence a sick or injured person to engage any particular physician or surgeon or to change to a suggested physician or surgeon.

Personal.—Dr. Charles O. Lindberg, Edwardsburg, Mich., has been chosen head of the medical staff of the Community Hospital at Grantsburg.——Dr. George B. Durand, Waupun, was guest of honor at a farewell dinner given recently by Waupun physicians; he has retired from practice in Waupun and plans to leave the city, newspapers reported.

Appointments to State Board.—Governor Schmedeman announced five appointments to the state board of medical examiners, Dec. 21, 1934, as follows:

Dr. John R. Venning, Fort Atkinson, to succeed the late Dr. Archibald D. Galloway, Barron.

Dr. Alvin G. Koehler, Oshkosh, to succeed Dr. Wilbur N. Linn, Oshkosh.

Dr. Charles W. Giesen, Superior, to succeed Dr. Thomas J. Sheeby, Tomah.

Edward C. Murphy, D.O., Eau Claire, to succeed himself.

Dr. Bartholomew E. McGonigle, Ableman, to succeed Dr. Adam J. Gates, Tigerton.

GENERAL

Changes in Status of Licensure.—The State Board of Medical Examiners of Oklahoma has reported the following action:

License of Dr. Jasper C. Holland, Grove, suspended for five years for violation of the federal narcotic laws, Dec. 11, 1934.

The Kansas Medical Board reports the following action:

Dr. John F. Northrup, Topeka, license revoked, Dec. 11, 1934, for conviction on a felony charge.

The Maine State Board of Registration in Medicine reports the following:

Dr. Joseph Abbott Nile, Rumford, Maine, license revoked, Nov. 13, 1934; he was convicted under the Harrison Narcotic Act for the illegal dispensing of morphine and sending it through the mails.

The Massachusetts Board of Registration in Medicine reports the following:

Dr. Sarah Margaret Brown, Boston, license revoked Dec. 20, 1934, for deceit in the care of a patient.

Dr. Rafael Reyes Garcia, Springfield, license revoked, Dec. 20, 1934, for deceit in the care of a patient.

News of Epidemics.—Retreat Mental Hospital, Retreat, Pa., reported 200 cases of grip among its 900 inmates. The Luzerne County Prison was quarantined because of several cases, newspapers reported January 6.——Scarlet fever, which has been epidemic in Milwaukee for many months, caused one parochial school to close in January. The number of cases in the city February 1 was 1,361.——The state health department of Washington reported 249 cases of smallpox in the state from January 1 to 22; Bremerton papers reported 100 cases in and near that city. A large number of cases were also said to have occurred in the vicinity of St. Anthony, Idaho.——Illinois is reported to be having the most severe measles epidemic since 1926; the state health officer said January 20 that 1,307 cases were reported in the preceding five days.——A severe respiratory infection is epidemic among Indians on the Navajo reservation about Ganado, Ariz., *Southwestern Medicine* reports. The eighty bed hospital at Ganado Mission is reported to have had 125 patients.——Schools were closed in Tresckow, Carbon County, Pa., January 27, because of an outbreak of cerebrospinal meningitis.

Medical Bills in Congress.—*Bills Introduced:* S. 1615, introduced by Senator Hatch, New Mexico, proposes to prohibit the shipment and transportation in interstate or foreign commerce of cannabis and its derivatives and compounds. S. 1737, introduced by Senator Frazier, North Dakota, proposes to prohibit experiments and operations on living dogs in the District of Columbia for any purpose other than the healing or curing of the dog. H. R. 4462, introduced by Representative Thomason, Texas, proposes that for the purposes of promotion, longevity pay and retirement there shall be credited to officers of the Veterinary Corps, and former officers of the Veterinary Corps now on the retired list, all full time service rendered by them as veterinarians in the Quartermaster Department, Cavalry or Field Artillery. H. R. 5279, introduced by Representative Underwood, Ohio, proposes to adjust and equalize benefits for veterans and widows and dependents of veterans. H. R. 5289, introduced by Representative Gearhart, California, proposes to erect a Veterans' Hospital in California. H. R. 5371, introduced by Representative Hoeppel, California, proposes to grant hospital treatment and domiciliary care in veterans' hospitals to the retired personnel of the armed services of the United States. H. R. 5386, introduced by Representative Robsion, Kentucky, proposes to provide payment of pensions for disability or death incurred in the regular military or naval service. H. R. 5549, introduced by Representative Dunn, Pennsylvania, proposes to provide "for workers' health insurance."

CORRECTION

Incubation Period in Tetanus.—In Miller and Rogers' article on tetanus in THE JOURNAL, January 19, page 188, column 2, it is stated that a short incubation period tends to be a good omen. This is erroneous. A short incubation period offers a bad prognosis, and a long incubation period a good prognosis.

Government Services

OPENING OF THE FEDERAL NARCOTIC FARM, LEXINGTON, KENTUCKY

The first United States Narcotic Farm, near Lexington, Ky., will open for the reception of admissions on or about May 1. It will accommodate a maximum of 1,000 persons and is designed to accommodate males only. Its object and purposes are to rehabilitate, restore to health and train to be self supporting and self reliant those who are admitted thereto. The control, management and discipline are to be maintained for the safe keeping of the individual and the protection of the community. Experiments are to be carried on to determine the best methods of treatment and research in this field, and the results disseminated to the medical profession and the general public to the end that states may make some provision for establishing a similar policy for helping to solve the problem of drug addiction. The function of the institution at Lexington therefore assumes the character of a treatment and research center and of an educational and rehabilitation center with certain custodial features superimposed.

Heretofore, as far as public policies are concerned, drug addiction has been regarded solely as a penal and correctional problem without cognizance being taken of its medical, sociological or economic significance. The institution is to be administered by the United States Public Health Service. As a matter of convenience to Fellows of the American Medical Association, there is herewith printed the regulations governing admissions to that institution.

REGULATIONS GOVERNING THE ADMISSION OF PERSONS TO A UNITED STATES NARCOTIC FARM, EFFECTIVE APRIL 1, 1935

ARTICLE I.—*Admissions.*—1. No person shall be eligible for treatment or confinement in a United States narcotic farm unless he be an addict as hereafter defined and then only: (1) if such person has been sentenced to confinement upon conviction of an offense against the United States, including convictions by general courts-martial or by consular courts; (2) if such person is completing a sentence of confinement at a narcotic farm and applied in accordance with the requirements of these regulations for further custodial care and treatment beyond the expiration of sentence; (3) if such person is placed on probation by any court of the United States or other Federal authority which has imposed as one of the conditions of such probation that he will submit himself for treatment until discharged as cured; or, (4) if such person, being not an unconvicted alien, voluntarily signs an application requesting custodial care and treatment in accordance with the requirements of these regulations. Upon admission to a narcotic farm as provided by these regulations such four classes of addicts will be designated and hereafter referred to in these regulations as "prisoners," "ex-prisoners," "probationers" and "voluntary patients," respectively; collectively, they will be designated and hereinafter referred to as "addicts," "inmates," "patients," or "beneficiaries."

2. The term "addict" wherever used in these regulations means any person who habitually uses a habit-forming narcotic drug so as to endanger the public morals, health, safety, or welfare, or who is or has been so far addicted to the use of habit-forming narcotic drugs as to have lost the power of self control with reference to his addiction.

3. The terms "habit-forming narcotic drug" or "narcotic" wherever used in these regulations mean opium and coca leaves and the innumerable alkaloids derived therefrom, the best known of these alkaloids being morphine, heroin and codeine, obtained from opium, and cocaine derived from the coca plant; all compounds, salts, preparations, or other derivatives obtained either from the raw material or from the various alkaloids; Indian hemp and its various derivatives, compounds and preparations; and peyote in its various forms.

4. A prisoner shall be admitted to a narcotic farm for treatment and confinement therein, upon presentation to the medical officer in charge of such farm of a copy of the sentence and/or commitment, or other certificate showing the conviction, sentence of confinement and commitment of the prisoner, accompanied by an order by the authority vested with the power to designate the place of confinement of the prisoner or of the authorized representative of such authority, designating such narcotic farm as the place of confinement and certifying that such convicted person is an addict. Such documents shall be supplemented by the certificate, or a copy thereof, to be executed by the prosecuting officer after conviction and sentence on a form prescribed by the Surgeon General, stating his belief that the convicted person is an addict, his reasons for such belief, and all pertinent facts bearing on such addiction, together with the nature of the offense.

5. A prisoner, at the expiration of his sentence at a narcotic farm, may be considered for continued treatment therein as an "ex-prisoner" upon submitting application to the Surgeon General on a form prescribed therefor. Such application must contain an agreement to submit to custodial care and treatment for the maximum time estimated by the Surgeon General as necessary to effect a cure or until he ceases to be an addict and be accompanied by a certificate from the medical officer in charge stating that at least one month prior to the expiration of sentence the prisoner has been examined, that he is still an addict, that he may by further treatment in a narcotic farm be cured of his addiction, and estimating the maximum time necessary to accomplish such cure. No prisoner shall be continued for treatment beyond the expiration of his sentence except upon receipt of the Surgeon General's written approval of the application, and then only for such period of time as has been estimated as necessary to accomplish a cure.

6. A probationer shall be admitted to a narcotic farm for treatment upon presentation to the medical officer in charge of an authenticated copy of the order entered by any court of the United States or other Federal authority having power to suspend the imposition or execution of sentence and place a defendant on probation under any existing law, showing that such convicted person has been placed on probation and that the court or other Federal authority has imposed as one of the conditions of such probation that such person shall be admitted and submit himself for treatment at a narcotic farm until discharged therefrom as cured of his addiction; such document shall be supplemented by a certificate executed after conviction by the prosecuting officer or probation officer on a form prescribed by the Surgeon General, such certificate stating the respective officer's belief that the convicted person is an addict, his reasons for such belief and all pertinent facts bearing upon such addiction, together with the nature of the offense.

7. Any addict, except one who is an unconvicted alien, may be considered for admission to a narcotic farm for treatment and confinement therein as a voluntary patient upon filing application with the Surgeon General on a prescribed form. Such applicant must agree to submit to custodial care and treatment for the maximum time estimated by the Surgeon General as necessary to effect a cure or until he ceases to be an addict. Unless he be a beneficiary of the United States Public Health Service as provided by law and regulation, such applicant must agree, if so required by the Secretary of the Treasury, to reimburse the Government for his subsistence, care and treatment and accompany his application by a recognizance, stipulation, bond, or undertaking in form and amount to be approved by the Secretary of the Treasury guaranteeing the cost of his subsistence, care and treatment. Such application must be accompanied also by a medical certificate executed on a prescribed form by a qualified physician designated by the Surgeon General. Such certificate must state whether the applicant is an addict, whether the designated physician believes that the applicant may by treatment in a narcotic farm be cured of his addiction, the estimated time necessary to effect a cure, and any further information bearing on the addiction, habits, or character of the applicant that may be pertinent. No such addict may be admitted unless the application is approved by the Surgeon General and unless suitable accommodations are available after all eligible addicts convicted of offenses against the United States have been admitted.

8. The medical officer in charge shall not admit nor accept responsibility for any addict applying or presented for admission to a narcotic farm when in doubt as to the eligibility of such addict or as to the sufficiency of the documentary evidence presented to established eligibility. In such cases he shall report the salient facts together with any recommendation he may desire to make to the Surgeon General for decision. Persons otherwise eligible may be refused admission when accommodations are not available or when appropriations are insufficient for their transportation, maintenance and care.

9. The actual and necessary expenses incident to the transfer to a narcotic farm of prisoners or probationers, including the actual and necessary round trip expenses of custodial officers required in the transfer of prisoners, shall be chargeable to the appropriation for the maintenance of such farm when authorized by the Surgeon General. No payment shall be made from such appropriation for any of the expenses of transporting to a narcotic farm ex-prisoners or voluntary patients.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 19, 1935.

Socialist Politicians and Misleading Propaganda

The attempt of a woman's organization, "The Maternal Mortality Committee," to represent maternal mortality as connected with malnutrition due to unemployment was reported in THE JOURNAL, Dec. 8, 1934, page 1787. The members of the committee passed a resolution stating that they were deeply impressed by the reports of malnutrition among married women in areas of prolonged unemployment, and they sent a deputation to the minister of health. He replied that there was no evidence showing a close relation between malnutrition and the maternal mortality rate. Of the deaths examined, at least one half occurred among well-to-do people, and it was significant that the maternal death rate for 1933 in such a depressed area as Durham was no higher than in the relatively prosperous county of Middlesex. Nevertheless the conditions in the depressed area were such as to give rise to anxiety and the position was receiving the close attention of the administration. Local authorities had been urged to make full use of their powers, in appropriate cases, to supply milk and other foods to expectant and nursing mothers. Attention was being directed to improving the antenatal service, insuring the availability of a trained midwife able for all confinements, the provision of maternity beds for complicated cases and patients with unsuitable home conditions, facilities for isolation of septic cases, and providing the services of a consultant in difficult cases.

It has been shown by the report of the chief medical officer of the ministry of health that the general health of the population is well maintained in spite of economic difficulties. Indeed, he stated that the nutrition of the English people is better today than it has been at any period of which there are records. The infant mortality rate for the quarter ended last September was the lowest ever recorded, being 45 per thousand live births and 7 below the average of the ten preceding third quarters of the year. Yet socialist politicians are constantly representing the people as suffering in health because the government or local authorities do not give more away. The fact is that the unemployed in this country are better off than those in full work in many European countries. But however much the state does in the way of relief, socialist politicians clamor for more and use misleading propaganda.

Transportation of Patients with Fracture of the Spine

In 1931 Mr. R. Watson Jones of Liverpool introduced the manipulative reduction of crush fractures of the spine, so common in automobile accidents. He pointed out that the kyphotic deformity is one of acute flexion at the site of injury. Therefore reduction can be effected only by the opposite movement. If a patient with crush fracture of the vertebra, within a few days of the injury, lies prone with hyperextended spine, supported only by his arms at the side of his head and by the front of his thighs and legs, leaving the trunk entirely unsupported, the body weight alone is sufficient to restore the vertebra that has been crushed into a wedge. Plaster is then applied in this position. This teaching affects first aid treatment. If the patient is put on a stretcher in the usual position, on his back, this tends to increase the deformity, while if he is placed prone the deformity will be reduced. Hence ambulance men have been taught to put the patient in the prone position on the stretcher. However, this practice is not universally accepted, as the following shows:

At the annual meeting of the British Orthopaedic Society, Mr. T. P. McMurray of Liverpool said that in fractures of the spine the advantage of face-down transportation was that the postural movement necessary for reduction was instituted at once, so that the risk of injury to the cord was minimized. The disadvantages were that patients suffered from shock and that lying on the face embarrassed respiration. There might be fractures of several ribs with danger of visceral injury. He upheld the practice of transporting the patients on their backs. First aid workers could not be expected to diagnose fractures of the spine, and the practice of turning patients over was dangerous. Mr. McMurray's recommendation was supported by one surgeon but was opposed by all the others, including Mr. Watson Jones, who said that ambulance men were already taught to turn these patients over, but on their backs, and to lift them by a method that inevitably produced hyperflexion. If a patient with a fracture dislocation was carried in this manner, severance of the cord was inevitable. The association of rib and spinal fractures was so rare as to be negligible, and in any event the ribs were more likely to be fractured in front than behind. Professor Haughton of Dublin said that the diagnosis should not give rise to difficulty. If after a severe injury a conscious patient complained of pain in the back and inability to move one or both legs, he should be lifted and carried face downward. Mr. H. O. Clarke of Manchester said that there could be no doubt that ordinary face-up lifting was capable of producing paraplegia.

A New Method of Taking Impressions of Finger Prints

Detective Inspector Webber has discovered a new method of taking impressions of finger prints, which has the advantage of dispensing with the camera. The present system is to smear a powder, which brings up the print, and this is then photographed. The new powder is merely smeared over the object where a trace of finger print can be detected. Copies are then taken direct on a sensitized paper record. The police authorities are sanguine that the powder will be effective in taking finger prints from dark and dull backgrounds and that a sharp black and white print will be obtainable from even a dull and rough wall. The powder has not yet been officially adopted for general use by the police, but there is reason to believe that the final experiments will be successful and that its use will be approved. So far the powder is said to be an unqualified success. Its composition has not been stated.

The War on Locusts in South Africa

South Africa is engaged in the greatest war on locusts in its history. Almost the whole of the union and the neighboring territories are threatened by locusts of one variety or another. Indeed, the only area that is not threatened at present is the coastal belt of the Cape Province. During the last two months an intensive campaign against the hoppers of the brown locust is coming to a successful close. Sixty-two districts, comprising an area of 230,000 square miles, are affected. If South Africa had to fight only the brown locust she would have little to fear, but three other varieties are infesting parts of the union. The desert locust has appeared in the Northwest Cape and in the Western Free State and also in Southwest Africa. A campaign will eventually be required against the hoppers of the next generation. The tropical migratory locust is on the increase in the Ceres and Clanwilliam districts of the cape and is causing grave anxiety for the grain producing districts. But it is the red locust that is the greatest danger. Its infestation has been heavy and widespread throughout the year, chiefly in Natal and Zululand and northern Transvaal. Great swarms are converging on the union from the north, of which the advanced guard has penetrated deep into the cape district.

Since the locusts first appeared late in 1933, an energetic campaign has been continuously waged against them, which cost $2,500,000 to the end of June. Success has been only partial and the swarms in the country seriously threaten the closely cultivated sugar districts near the coast. Closeness of cultivation is one of the main obstacles to success. In less settled areas the farmers have been able to protect their crops by mobilizing their employees and other natives, who make a prodigious noise and so prevent the swarm from settling on cultivated ground. When they afterward settle in the open country they are sprayed with a solution of sodium arsenite, of which the government has distributed thousands of tons. But in coastal Natal nearly the whole country is under cultivation and the swarm can only be driven from one field to another.

The employment of sodium arsenite on the swarms that have settled in a cane field is usually effective but causes great damage to the crop. Another method is to singe the insects at night when settled with improvised flame throwers. Some mitigation is hoped for from the larvae of Stomorhina lunata, which is said to be breeding rapidly and destroying the locust eggs. The government maintains two airplanes near the Portuguese border, which dust any swarms of locust with sodium arsenite after they have settled. It has proved almost impossible to deal here with swarms from the ground, as the country is exceedingly malarious.

Functional Paralysis Following Injury—Damages Awarded

An unusual case in which a man suffered no physical disability after an automobile accident and yet was awarded damages has occupied a London court. Last August he was struck by a car, which mounted the pavement. He was only slightly bruised and walked home. Fourteen weeks ago he had to go to the hospital and now he could walk a few steps only with difficulty. A physician from the hospital said that he and other physicians were satisfied that the man was not malingering. He was suffering from traumatic neurasthenia. Dr. Henry H. Kessner of Newark, N. J., now lecturing in this country, said that after fifteen years of specialization in industrial act cases in America he was satisfied that the man had no physical disability. It was all a matter of thought. The man had been told that he was in very bad condition and so believed he was. The judge in awarding $1,750 damages said that if the motorist had struck a man of particularly nervous temperament, that was his ill luck.

The Prognosis in Coronary Occlusion

At the Royal Society of Medicine an important discussion on the prognosis in coronary occlusion was opened by Prof. John Hay of Liverpool. He said that the initial mortality was heavy and quoted the figures of Carey Coombs, who in a total of 144 cases reported forty-nine deaths in or soon after the initial attack. Of the survivors, thirty-two died within twelve months. It could be said that they would all sooner or later die a cardiac death. They could be divided into two groups, the first of which consisted of those in whom cardiac disability was shown by an increasing tendency to dyspnea and a gradual drift toward failure of the congestive type. Pain was not the dominant feature in these patients. This group also included those whose cardiac reserve was further hampered by auricular fibrillation, which might have originated in the attack of occlusion or have begun later and become permanent. The prognosis in this group was bad from the start. Their future was a matter of months. The second group consisted of those who made a satisfactory recovery and could lead reasonably useful lives, though rarely entirely free from some form of cardiac distress. But they learned to live within their limitations and sometimes showed surprising longevity. They eventually succumbed to some kind of cardiac difficulty and seldom from some intercurrent disease. The life of this group could be measured by years. If the first critical stage was weathered, their expectation was from two to five or more years. John Hunter was a classic example. His first attack of coronary thrombosis occurred at the age of 45, twenty years before his death. Three years later he had a second attack, and during the last few years of his life he was liable to attacks of effort angina. Yet he continued to live at high pressure. Professor Hay had one patient who died at 70, fourteen years after his first attack. He was liable to slight angina of effort. In cases of coronary occlusion two facts stood out: (1) the frequency of sudden death, presumably by a terminal thrombosis; (2) the significance of a progressive tendency to dyspnea and congestive heart failure. The younger patients were more apt to recover and their expectation of life was a little longer.

PARIS

(From Our Regular Correspondent)

Jan. 3, 1935.

Protection of Civilians During Gas Attacks

A sixteen page pamphlet has just been issued by the police department of Paris stating in detail the precautions to be taken by the civilian population during air raids. A large number of illustrations show the character of the shelters that should be sought, which can be rendered as nearly impermeable to penetration by poison gas as it is possible at the present time to imagine. All those who can leave their homes are told to go to the countryside immediately, in order to avoid crowding of the roads leading from the city. If possible, a cellar should be prepared which has very thick walls and into which has been placed water, canned foods and surgical dressings. A cellar 90 feet square can be utilized for only five hours by four persons. All windows in rooms should be tightly closed and a gas mask adjusted immediately if no cellar is available. Civilians are warned not to become panic sticken and are reminded that an active anti-air raid force has been organized. The recent experiences in anti-gas attack maneuvers in England and France have shown that, in spite of ample warning, large cities like Paris and London cannot be fully protected because weather conditions may be such that an enemy plane containing explosive, incendiary or gas shells can escape the vigilance of the defending forces and launch toxic gas or explosives before being stopped. Circulars similar to the Parisian have been published in Russia, Germany and Italy. In Russia, over ten million people, under government supervision, are calling attention to the dangers to civilians, and instruction in regard to defense against air raids is compulsory in the public schools. In Germany, this passive defense is well organized and repeated drills are given as to how to behave during gas attacks and every one is advised to be provided with masks. In Italy, all public buildings must contain gas-proof cellars and an effort is being made to build tunnels for civilians. In spite of the Paris police department pamphlet, few citizens have taken the question of gas attacks seriously, having full confidence in the ability of the well organized defensive forces to check any such raids.

Recently the sirens that will give warning of impending raids have been sounded as a trial measure, in all parts of the French capital. To people living as far removed from any potential air-raiding enemy as those in the United States, such elaborate precautions seem unnecessarily alarming; but with the various countries as close to one another as they are in Europe, reminders to civilians that modern warfare is no longer confined to the regions where the opposing armies are in contact do not seem superfluous.

Bladder Function After Spinal Cord Injuries

Since the World War there has been a discussion as to whether voluntary micturition was ever possible after a complete transverse division of the sacrolumbal segments of the spinal cord. Basing their opinion on the experiments of Goltz and Ewald and of Müller, physiologists and neurologists maintain that there is some prospect of voluntary micturition returning. Goltz and Ewald in 1896 observed such a result, several weeks after removal of the sacrolumbar and a part of the dorsal portions of the cord in dogs. They believed that nerve centers of sympathetic origin, located in the bladder wall, could take over the work of the spinal centers. Müller in 1918, after removal of the sacrolumbar portion of the cord or of the conus terminalis alone in the dog, noted spontaneous expulsion of urine after twenty-five days of retention. This investigator maintained that the centers which controlled the detrusor action were not located in the spinal cord but in the sympathetic ganglions of the pelvis and that these centers continue to function even after division of the cord. This view has been abandoned almost universally and there exists but little doubt that the centers for voluntary micturition are in the spinal cord, the transverse division of which always results in retention.

Roussy and Rossi in 1910 found that after removal of the conus terminalis or of the cauda equina in dogs and monkeys the paralysis of the detrusor and abolition of the reflex evacuation of the bladder was permanent (six months) and that there was no reason to assume the existence of extramedullary centers; hence the existence of automatic micturition seemed doubtful.

An important paper on this subject was presented at the Dec. 4, 1934, meeting of the Academy of Medicine by Hermann, Morin and Vial. They were able to keep alive for six months a dog whose spinal cord had been removed as high as the level of the first dorsal vertebra. Retention of urine occurred as soon as the cord was destroyed, and the bladder contained at times as much as 900 cc. of urine. The bladder emptied itself by the familiar phenomenon of overflow, but it was necessary to augment this mode of spontaneous emptying by pressure over the bladder in order to avoid complications. During the first weeks after cord destruction, one could feel the bladder wall contract and expel some urine, but not sufficiently to empty the bladder completely. This occurred also when a thermometer was inserted into the rectum or when the animal's position was changed. One could, of course, think of the possibility of centers of automatic micturition as held by Goltz, Ewald and Müller, but such spontaneous evacuation was only transitory. Hermann and his co-workers explain such a temporary emptying as being due to a hyperexcitability of the detrusor following cord destruction, because it became more and more difficult to empty the bladder by external pressure, until the retention became complete and has remained so. These experiments confirm those of Roussy and Rossi and are opposed to those of the other investigators.

As there is much difference of opinion on the part of neurologists and surgeons concerning the treatment of retention following spinal cord injury, these experiments are of great interest. They show that there is no prospect of a return of spontaneous micturition, even after a long period of observation.

Epileptiform Seizures During Pneumothorax Insufflations

Reflex cardiac and respiratory symptoms following thoracentesis for pleural effusions have been known for some time. Secousse of Bordeaux calls attention to convulsive seizures that have been observed during introduction of air for the purpose of establishing a pneumothorax in tuberculosis. Such reflex irritation of the nervous system occurs especially in cases in which the pleura is very thick as the result of inflammatory changes. The epileptiform seizures are at first limited to the face or to one extremity and then become generalized. There is also a paralytic form of reflex, preceded by convulsions, but the monoplegia or hemiplegia is of short duration, from a few hours to a few days. One ought to give sedatives before attempting a pneumothorax in nervous individuals, avoid multiple punctures, always have a preliminary roentgenogram of the chest, and not begin the insufflations until the oscillations of the manometer have ceased and one is certain that the pleural cavity is empty. When epileptiform symptoms appear, morphine with caffeine or epinephrine should be given immediately.

Appointments

Prof. R. Debré, professor of bacteriology at the Medical School of Paris, has just been elected a fellow of the Academy of Medicine, one of the highest honors that can be bestowed on a physician by his colleagues.

Prof. F. Bezançon, an authority on pulmonary tuberculosis, has been selected to be professor in that subject, a position which had been occupied by the late Prof. Léon Bernard.

BERLIN

(From Our Regular Correspondent)

Dec. 10, 1934.

Investigation of Arsenic Poisoning in Wine-Growing Regions

Arsenic poisoning after the drinking of wine was reported in THE JOURNAL, July 23, 1932, page 319. A systematic study of this problem, however, seems to have been conducted only recently, even though chronic arsenic poisoning of this origin has been observed for years in the wine-growing regions of Baden. Because some of the cases were considered occupational diseases, the federal ministry of the interior appointed a committee of experts, under the directorship of Professor Uhlenhuth, to make an investigation. The disorder is surprisingly frequent in the wine-growing region of the Kaiserstuhl. The investigation considered the manner in which the arsenical spraying preparations are employed in the vineyards, the familial hypersensitivity and also other factors, among which probably the excessive consumption of the wine, with its damaging effect on the liver, plays the most important part. The patients are usually strong drinkers and many of them have cirrhosis of the liver. According to the lecture by Uhlenhuth before the medical society in Freiburg, it has to be determined whether the arsenical dusting substances should be entirely prohibited, and whether it would be possible to use other preparations that are free from arsenic (for instance, pyrethrum or nicotine).

Half of the fifty patients were observed by Professor Ziegler in the polyclinic. The arsenic content of the parasiticides amounts to from 4.3 to 7.3 per cent. The most severe symptoms of poisoning occur almost exclusively in dry, volcanic regions. The disorder attacks men almost exclusively. The "house drink," which is consumed in large quantities, is obtained by hard pressing of the grape husks. It contains arsenic and is a contributory factor but rarely the only cause. The acute symptoms seem as a rule to disappear within a few days. In some cases, signs of chronic arsenic impairment develop after work is resumed with the parasiticides. These are not simply superficial irritations but a vital, universal damaging of the tissues, resulting from the absorption of arsenic. The respiratory tract apparently is the most important resorption surface. During this stage the most noticeable symptoms are those of the skin, characterized by hyperkeratoses on the inner and outer surfaces of the hands, the soles of the feet and the toes. Later there usually appears a small-flecked melanosis of the skin and other well known changes. That the nervous system is involved is indicated by abnormal moods, depression, disturbances in

the memory and polyneuritis, usually of the sensory type, and particularly a hypersensitivity to cold. There are disturbances in the sympathetic and endocrine systems indicated by loss of tonus, disturbances in the vasomotor regulations, impotence, hyperglycemia and true diabetic glycosurias. In case of cirrhosis of the liver, it is possible that both alcohol and arsenic impair the hepatic parenchyma and that these two damaging factors promote each other. The same applies to hemochromatosis. The course of the disease differs in the individual cases. Complete cures have been observed after elimination of the causal factors. Generally the disease takes an unfavorable course and may be drawn out over a number of years. The mortality so far has amounted to 16 per cent. Limitation of working capacity is considerable, even in mild cases. The treatment should begin even in acute cases by administering absorptive substances. In chronic cases the intravenous administration of from 10 to 20 cc. of a 5 per cent solution of sodium thiosulphate is advisable. Later, liver preparations, borax baths and sulphur-salicylic ointment may be applied. The protective measures are of especial importance.

Chemical studies are being made, particularly on the amount of arsenic in the "house drink." As was to be expected, considerable quantities of arsenic were detected in the hair of the patients.

Methods for the Improvement of Spinal Anesthesia

Professor Kirschner, ordinarius for surgery in Heidelberg, has studied methods for the improvement of spinal anesthesia for a number of years. Heretofore, spinal anesthesia has had the disadvantage of the uncertainty of the onset of the anesthesia, particularly in case of operations in the upper portion of the abdomen; also of disturbances caused by a reduction in the blood pressure, in which case the blood vessels of the region became paralyzed, and finally of the indefinite limitation of the effects toward the head with impairment sometimes of the respiratory center.

Kirschner now uses an anesthetic solution, which, owing to the addition of alcohol, is lighter than the cerebrospinal fluid and has a specific gravity of 0.986. Following withdrawal of cerebrospinal fluid, the vertebral canal is partially refilled with the anesthetic solution while the head is lowered. The height of the anesthesia may be determined by quickly testing the sensitivity. The upper limit may be determined exactly; it should never go higher than the mamilla. When the anesthesia subsides, feeling returns first in the legs. The blood pressure is as a rule not at all reduced. The quantity of the anesthetic is small; for instance, 2 cc. of a 0.5 per cent solution of nupercaine. In extremely excitable patients, from 0.2 to 0.3 mg. of scopolamine is administered intravenously. The postoperative pain usually is still dulled on the following day. Eventually the after-pain takes the form of a headache, but this is usually not severe and the remedy is the intravenous injection of a 20 per cent solution of dextrose. This anesthesia has thus far been tried in 2,000 cases. It has only a slight influence on the organism as a whole. Icterus and diabetes are not contraindications. It is unnecessary to hurry the course of the operation. Disadvantages of the method are that the operation requires from twenty to thirty minutes of preparation and that the operation must be performed in the Trendelenburg position.

Advertising Remedies at Public Lectures

Several months ago the ministry of the interior directed that it should be determined in each case whether there is reason for the prevention of a lecture in which are discussed certain curative methods or procedures, "without confusing the population and without advertising definite remedies." The regulation that lectures of this type should not be prohibited seems to have been abused. While definite remedies are not advertised in the lecture itself, following the lecture the persons who attended and whose addresses were taken on entering the lecture hall are solicited by agents of the firm that makes the remedies or apparatus. Such a procedure evades the regulations and cannot be tolerated. The minister admits that there may be some need for reliable apparatus for the preparation of water that contains radium emanations for drinking or bathing, as well as radium cushions or compresses, but it cannot be admitted that such products should receive especial recommendation in public lectures. Moreover, the representatives of firms who produce such radioactive apparatus are not suited to enlighten the people in matters of health. In this connection it may be mentioned that recently the "biochemical society" (this misleading name has nothing in common with biochemistry as a physiologic science) of Berlin put posters on numerous houses, informing the public that it would give "information and consultation in all types of illness." The federal minister of the interior considered such advertisement for a "natural method of healing" as undesirable and prohibited the performance.

The Germans Spend Millions for Alcoholic Beverages

The expenditures for alcohol in Germany during the year 1933-1934 amounted to 3.042 million RM. The acreage of viniculture, which had gradually decreased since 1911, has again increased in the last two years. The wine consumption amounts to about 4 liters per capita, the average cost of which may be estimated as 4.40 RM. The efforts to create a greater market for the German wines have been unsuccessful as a result of the simultaneous advance in prices. An essential detriment for greater wine consumption is the preference for beer, for which the competition was eased by special tax reductions. That the population expended 546 million RM for distilled liquors during the year 1933-1934 (April 1 to March 31) is to be considered with grave concern. Per capita, the inhabitants of Germany consume 0.814 liter of alcohol, or 2.32 liters of drinkable liquor with 35 per cent of alcohol by volume. This represents an expenditure of 8.57 RM per capita. The expenditure for beer during the same period, with a total consumption of approximately 34 million hectoliters, amounted to 2.206 million RM; that is, a per capita expenditure of 33.8 RM for 51.8 liters each.

MEXICO

(From Our Regular Correspondent)

Dec. 29, 1934.

The Want of Special Regulations Concerning the Practice of Medicine

The present constitution of Mexico was promulgated in 1917. There is a statement in article 4 that the practice of certain professions will be governed by special regulations concerned with the designation of the schools and authorities which are empowered to give diplomas and licenses to practice. Seventeen years has passed and the special regulations are not, as yet, in effect. Because of the propaganda made by the homeopathists, especially through the newspapers, some physicians have recently published articles which are aimed at stopping the practice of homeopathy. A controversy has developed and the homeopathists are now challenging the physicians, through the press, to debate before the public (1) whether or not homeopathy is based on scientific grounds, (2) whether it is a rational method for the cure of disease, (3) whether it is a method recognized also in some other countries and (4) whether medicine has in any form derived any benefit from homeopathy.

Improvements at the General Hospital

The General Hospital of Mexico City, because of improvements recently made, will be in the near future an important medical center. A maternity department adjoining the hospital has been opened with the help of a bequest in the will of

Señora Lavin and an appropriation from the board of public welfare of the city. The building is modern, with large halls and comfortable rooms for pregnant women and for infants, and has well equipped rooms for operations and treatment. There are 300 beds.

Another great improvement is the children's hospital, a six story building adjoining the General Hospital, the construction of which will be finished soon. The building has room for 600 children, with excellent arrangements for sunlight and air.

The General Hospital is made up of pavilions, each of which has forty beds and is encircled by gardens. This disposition has disadvantages in connection with the transport of patients after operations. To avoid the inconveniences, the separated pavilions are to be united in only two large wings, for surgery and for internal medicine respectively, each of which will contain 500 beds. Two additional pavilions are to be constructed for infectious diseases and for specialties. The General Hospital as a whole will have, through the various improvements, a total of 3,000 beds.

A Physician Appointed President of the University of Mexico

The pay of teachers of the University of Mexico and other expenses in the university were reduced during 1934 on account of economic conditions. The federal government has given the university through the secretariat of public education 5,000,000 Mexican pesos (about $1,350,000) for expenses in 1935. At the same time Dr. Fernando Ocaranza, who for many years has been a professor of the School of Medicine and later director of the school, has been appointed head of the university. The medical school, during its centennial celebration in 1933, received several gifts, which made possible new laboratories of chemistry and bacteriology and an amphitheater for dissecting and experimental work. A new department for clinical research will begin to function in 1935.

Campaign Against Leprosy

According to the latest census, there are about 2,000 lepers in the country. The campaign against leprosy has recently been intensified by the department of public health. A new dispensary for lepers was recently opened in Mexico City and five more are going to be opened in various states. All the dispensaries will be functioning in March and will have a personnel of specialized physicians, nurses and other workers. Three leprosariums at a total cost of 300,000 Mexican pesos (about $81,000) will be constructed.

Onchocerciasis

A careful study of the transmission of onchocerciasis is being carried on by a special committee under the chairmanship of Dr. Salvador González Herrejón. The condition has been found in persons living in the mountains of Oaxaca. The causal agent is a simulium, which transmits the infestation by its bite. The infestation results in blindness and mental disturbances. In some regions 80 per cent of the population is blind. The treatment of the condition is surgical and not very promising. A comprehensive monograph on the habits and reproduction of the simulia is in preparation and will serve as a basis for the campaign against onchocerciasis. Dr. González Herrejón has already published articles on his early observations. His work has been considered of great importance both in Mexico and abroad.

Meeting of Biologic Society

The Sociedad Mexicana de Biología held its annual meeting in Mexico City, October 22-26. The following articles were presented and discussed: the serologic relation between endemic and epidemic typhus in Mexico City, by Dr. Hermann Mooser; the bicolorimetric method for determination of p_H, Dr. Juan Roca; thalamencephalohypophyseal histologic entity, Dr. Anastasio Vergara E.; Mexican mosquitoes, Dr. Alfonso Dampf; blood groups in childhood from a biologic point of view, Dr. Jose F. Franco; meningo-encephalitis of bovinae, Dr. Javier Escalona; Bacillus Welchii isolated from the intestine, Dr. Pedro Vera; experiments with typhus antiserum, Drs. Gerardo Varela and Miguel Angel Parada.

Vaccination Departments

Vaccination departments for school children will be in operation during January of this year in about seventy different dispensaries of public health and welfare of the city and in different hospitals. Adults also will be vaccinated, if they wish, at the same stations. The vaccination of Indians in the rural districts is carried on without any difficulty now, as they have learned of its value and the lack of danger attending vaccination.

RIO DE JANEIRO

(From Our Regular Correspondent)

Dec. 15, 1934.

Visceral Leishmaniasis in Brazil

Dr. H. Penna recently reported the presence of visceral leishmaniasis in Brazil. With the aim of discovering evidence of any yellow fever that might be present, a branch laboratory was established in 1930 in northern Brazil. A histologic study of the liver of persons who died within ten days from the onset of their illness was made. The study yielded data on (1) the presence of yellow fever in towns and villages apparently free of the disease, (2) the distribution of some other diseases, such as malaria and schistosomiasis, and (3) the presence of hepatic lesions indicating visceral leishmaniasis (kala-azar), a disease not previously reported in Brazil. The material examined consisted of sections of liver taken from cadavers with a viscerotome, which were then fixed in a 10 per cent solution of formaldehyde and stained by hematoxylin-eosin. The sections showing leishmaniasis are characterized by the presence of organisms having the appearance of Leishmania, enclosed in large cells of the macrophage type inside the liver capillaries. The parasitic cells are round, about 2 microns in diameter, and have a nucleus and a kinetoplasm both of which take hematoxylin, although they are more distinct when the Romanowsky stain is used. With the Giemsa stain the cytoplasm stains light blue and the nucleus darker blue, while the kinetoplasm strongly stains a yellow red. The nucleus is round and the kinetoplasm is rod shaped. In a study by comparison of liver sections, prepared by Penna and of sections from authentic cases of kala-azar prepared by Dr. H. B. Aragão, no difference could be observed. The organisms obtained by Penna when compared with those of experimental leishmaniasis caused by Trypanosoma Cruzi, as seen in the liver, spleen and adrenals of inoculated dogs, showed some differences, especially related to their size. The organism isolated by Penna probably belongs to the form of Leishmania reported by Ross in 1903. Cultures have not been prepared as yet, because no clinical cases have been observed. Leishmaniasic lesions were found in forty-one sections from a total of 47,000 liver sections examined up to Sept. 30, 1934. The earliest age in the whole group was 45 days and the most mature, 56 years. Probably the figures of 1 per thousand of visceral leishmaniasis do not represent the actual proportion of the disease in Brazil, since it was found only in a selected group of persons who died within ten days of the onset of a disease. The study, as said before, was intended to discover the presence of yellow fever, which has a more rapid course than that of visceral leishmaniasis.

Carlos Chagas

Dr. Carlos Chagas, head of the Instituto Oswaldo Cruz and the discoverer of American trypanosomiasis (Chagas' disease), is dead. Dr. Chagas was born in Oliveira, Minas Geraes, in

1879 and he graduated from the School of Medicine of the University of Rio de Janeiro in 1903. He was appointed chief physician to the public health hospitals in 1904, head of the committee for prevention of malaria in Minas Geraes in 1905, assistant head of the Instituto Oswaldo Cruz in 1908 and head of the institute in 1917. He was appointed head of the commission for the study of malaria in the Amazon River region in 1912, head of the campaign against influenza in 1918, was director of public health in Rio de Janeiro from 1919 to 1926, professor of tropical medicine in the Faculty of Medicine of Rio de Janeiro in 1925, a permanent member of the Committee of Hygiene of the League of Nations in 1925, and technical head of the International Institute of Leprosy in 1933. He was awarded the Schaudinn prize and in 1925 the Kummel prize given by Hamburg University. Degrees and offices that he held included doctor "honoris causa" by the universities of Paris in 1926, of Lima in 1929 and of Howard and Brussels in 1933, honorary professor of the Universities of São Paulo and Minas Geraes and of the School of Medicine of Bahia, honorary member of the national University of Buenos Aires and of the University of Arequipa, doctor in agrarian sciences by the University of Buenos Aires, member of the Academy of Medicine of Paris, of the Society of Tropical Medicine and Hygiene of London, and of medical societies in Lima, Germany, Italy, New York, Belgium, Chicago and other places. Dr. Chagas was president of the Pan-American Conference of Pathology, Microbiology and Hygiene in Rio de Janeiro in 1929 and a delegate to the seventh Pan-American Conference in Montevideo in 1933, to the International Conference of Parasitology and Microbiology in Buenos Aires in 1916, to the Congress of Malaria in Rome in 1923 and to the International Congress of Hospitals in Atlantic City in 1929. He was invited to lecture in many places abroad and was honored with the following medals: Legion of Honor from France, the Order of Italy, the Order of Belgium, the Order of Alfonso XIII, the Order of Isabel la Catolica and the Order of Rumania.

BUCHAREST

(From Our Regular Correspondent)

Jan. 16, 1935.

Can Alcohol in the Human Body Become Ignited?

It is a popular belief in Rumania that the body of a person, soaked with alcohol, is combustible. Prof. A. Elfer of Cluj, in a popular lecture before the Hygienic Society, said that in past centuries it was earnestly deemed possible that the alcohol laden breath of a tippler may catch fire from the glow of an oven or even from his own pipe. Cases of "combustio spontanea," the burning of the body of itself, have been reported, especially in France, the first one in 1725. From the study of several hundreds of recorded cases it is evident that "self igniting" (this was its scientific term at that time) was more frequent with women than with men, more common in winter than in summer, and more common in cases of acute drunkenness than in the normal condition, and it is probable that they were simply accidents to which drunken persons, being careless, become victims by setting their clothes on fire. However, from the point of view of forensic medicine, it is important to decide whether such self ignition of the body is possible. It was alleged in 1847 that the countess Görlitz became ignited spontaneously in Darmstadt, Germany, and burned to death. A commission whose members included the greatest chemical experts of the age, Liebig and Bischoff, studied this case and completely refuted the theory of spontaneous combustion. The commission found that the human body, soaked with ever so much alcohol, could not ignite of itself by any means, nor could it easily be set on fire. In the decomposition of a corpse, inflammable gases may develop, but not even the ignition of these will lead to incineration. Liebig's investigations refuted the theory of self combustion for once and for all, but in eastern Europe the topic is still of great interest to laymen.

The Blind in Rumania

Dr. Virgil Popovici, senior physician to the Institute for Blind People in Temisoara, has written a little book on the blind in Rumania. According to this book, 34.5 per cent of all blind people of Rumania live in the Banate, 21.6 per cent in Transylvania, 6.64 per cent in the old kingdom, and 2.7 per cent in Bucovina. Banate is the province most infested by trachoma. Although the Hungarian government and its successor, the Rumanian government, have established dispensaries even in the remotest villages where free treatment and instruction as to protection against this scourge is obtained, trachoma is still difficult to eradicate. Popovici says that in Rumania there are only 64 blind persons per hundred thousand of population. As to the nationality of the blind people, 46 per cent are Rumanians, 24 per cent Germans, 30 per cent Magyars, 6 per cent Jews, and 4 per cent Slavs; 41 per cent of the blindness is congenital. Dr. Popovici urges the formation of an association to aid the blind industrially and culturally and to conduct a campaign to defeat the conditions and causes that lead to blindness.

Tuberculosis in Rumania

Dr. Mangiurea, director of the demographic bureau, reports that the number of tuberculosis patients in Rumania is about 400,000 and that the hospital and sanatorium beds at the disposal of these patients is 2,004 less than it was in 1926. It is imperative to provide at least 18,000 beds for these patients. Under the present critical economic conditions there is little hope that this can be accomplished. In the last three years, only one new sanatorium has been erected by the ministry of public health, the one in the forest of Pantelimon, near Bucharest. Two small sanatoriums, in Filaret and Zerlend, were closed, as they did not meet the requirements of the times.

The mortality from tuberculosis is about 2.7 per thousand of population. In the villages, and 15,200 tuberculous patients succumb annually, without having had medical care. Rumania spends one leu (at present about 1 cent) on tuberculosis per capita of the whole population; other countries spend from 20 to 100 lei.

Marriages

THOMAS LAURIN GRITZKA, Talmage, Neb., to Miss Lila Maude Lehman of Formosa, Kan., Nov. 18, 1934.

TERRY BIRD, Panama City, Fla., to Miss Eleanor Conner of Tallahassee at Headland, Ala., Dec. 30, 1934.

IRA MILBURN DIXSON, Stockbridge, Mass., to Mrs. Elizabeth Barber Hoffmann of New York, January 24.

ROBERT HENRY DE JARNETTE, Dahlonega, Ga., to Miss Mary Lou Gates at Mount Vernon, Dec. 27, 1934.

JULIAN BUSBY, Kannapolis, N. C., to Miss Margaret Little of Greensboro at Lexington, Dec. 24, 1934.

ROBERT STUART ROBERSON, Hazelwood, N. C., to Miss Eunice Simons of Colerain, Dec. 27, 1934.

THEODORE MORRISON CRAIN, Monterey, Tenn., to Miss Effie Judd at Harriman, Dec. 21, 1934.

VIOLETTA G. SHELTON, Los Angeles, to Mr. Etienne Girardot at Yuma, Ariz., Dec. 30, 1934.

ORCENA F. KNEPPER to Mr. J. Irvine Lyle III, both of Plainfield, N. J., Sept. 10, 1934.

JOSEPH MEREDITH BOOMER, Omaha, to Miss Naomi Schleiger of Lincoln, Neb., recently.

LEO DAVID O'KANE, Fullerton, Neb., to Miss Adelle Sindelar of Howells, Dec. 3, 1934.

Deaths

Ernest Oliver Joseph Eytinge ✠ Lieut., Commander, U. S. Navy, retired, Redlands, Calif.; Columbia University College of Physicians and Surgeons, New York, 1904; entered the navy in 1905 and retired in 1919 for incapacity resulting from an incident of service; fellow of the American College of Surgeons; formerly secretary of the San Bernardino County Medical Society; attending neurologist to the San Bernardino County Hospital; aged 54; died, January 20, of injuries received when the automobile in which he was driving overturned.

William Henry Bucher ✠ Lieut., Commander, U. S. Navy, retired, Olive View, Calif.; Medico-Chirurgical College of Philadelphia, 1896; entered the navy in 1898 and retired in 1909 for incapacity resulting from an incident of service; veteran of the Spanish-American and World wars; medical superintendent of the Olive View Sanatorium; aged 60; died, Dec. 30, 1934, at his home in San Fernando, of pneumonia.

Charles Carroll Habliston, Baltimore; University of Maryland School of Medicine, Baltimore, 1914; member of the Medical and Chirurgical Faculty of Maryland and the American Clinical and Climatological Association; associate professor of medicine at his alma mater; served during the World War; on the staff of the Baltimore City Hospitals; aged 44; died, January 17, of heart disease.

Henry Webster Bortner, Everett, Wash.; Ohio State University College of Medicine, 1914; member of the Washington State Medical Association; past president of the Snohomish County Medical Society; aged 45; served during the World War; member of the staffs of the General Hospital and the Providence Hospital where he died, January 8, of cirrhosis of the liver and nephritis.

John Alexander Campbell ✠ Williamsport, Pa.; College of Physicians and Surgeons, Baltimore, 1901; member of the House of Delegates of the American Medical Association, 1924-1927, 1929-1931; treasurer and past president of the Lycoming County Medical Society; on the staff of the Williamsport Hospital; aged 59; died, January 4, of influenza and pneumonia.

Percy Betterman Battey, Bedford, Hills, N. Y.; John A. Creighton Medical College, Omaha, 1911; member of the Connecticut State Medical Society, the American Psychiatric Association and the American Orthopsychiatric Association; served during the World War; medical superintendent of the Westfield State Farm; aged 46; died, January 3, of heart disease.

George W. Bushong, Tompkinsville, Ky.; Hospital College of Medicine, Louisville, 1897; member of the Kentucky State Medical Association; county health officer; for many years postmaster; also a druggist; on the staff of the Samson Community Hospital, Glasgow; aged 62; died, January 7, in St. Thomas Hospital, Nashville, Tenn., of pneumonia.

George Edgar Dean, Scranton, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1877; member of the Medical Society of the State of Pennsylvania; formerly county coroner; aged 81; for twenty-one years on the staff of the Lackawanna Hospital, now known as the State Hospital, where he died, January 12, of bronchopneumonia.

Robert James Carlisle ✠ New York; Bellevue Hospital Medical College, New York, 1884; professor of medicine, University and Bellevue Hospital Medical College; aged 75; consulting physician to St. Joseph's Hospital, Far Rockaway, the Bronx Hospital and Bellevue Hospital, where he died, January 15, of coronary thrombosis.

Zadock Troxell Kalbaugh ✠ Piedmont, W. Va.; University of the City of New York Medical Department, 1891; fellow of the American College of Surgeons; veteran of the Spanish-American and World wars; bank president; for many years member of the city council; aged 65; died, January 11, of cerebral hemorrhage.

Thomas Donald Keckich ✠ Gary, Ind.; Rush Medical College, Chicago, 1926; associate in ophthalmology, Northwestern University Medical School, Chicago; served during the World War; aged 36; on the staffs of the Methodist Episcopal Hospital and St. Mary's Mercy Hospital, where he died, January 9, of pneumonia.

Howard Clarke ✠ Honolulu, Hawaii; Tulane University of Louisiana Medical Department, New Orleans, 1905; fellow of the American College of Surgeons; served during the World War; on the staffs of the Queen's, Children's and St. Francis hospitals; aged 51; died, January 6, of carcinoma of the stomach.

George Frederick William Buttschardt, Queens Village, N. Y.; University and Bellevue Hospital Medical College, New York, 1902; member of the Medical Society of the State of New York; formerly on the staff of the Bethany Deaconess Hospital, Brooklyn; aged 61; died, January 21, of angina pectoris.

Chester Caldwell Funk, New Albany, Ind.; University of Louisville (Ky.) Medical Department, 1903; member of the Indiana State Medical Association; formerly health officer of New Albany; served during the World War; on the staff of St. Edward's Hospital; aged 54; died, January 15, of angina pectoris.

James Melvin Delevett, Baltimore; Baltimore Medical College, 1903; member of the Medical and Chirurgical Faculty of Maryland; formerly member of the school board; aged 62; formerly chief resident physician of the Maryland General Hospital, where he died, January 18, of pneumonia.

Isaac Lycurgus Van Zandt, Fort Worth, Texas; University of Louisiana Medical Department New Orleans, 1866; member of the State Medical Association of Texas; Civil War veteran; aged 95; died, January 10, of heart disease, prostatic obstruction and nephritis.

Frona Abbott, Denver; Denver Homeopathic College, 1899; formerly professor of hematology at her alma mater; aged 65; died, Dec. 28, 1934, in the Los Angeles General Hospital, of injuries received when the automobile in which she was driving was struck by a truck.

Minta Proctor Kemp, Philadelphia; University of Michigan Medical School, Ann Arbor, 1900; member of the Medical Society of the State of Pennsylvania; aged 59; on the staff of the Friends Hospital, where he died, Dec. 29, 1934, of carcinoma of the liver.

Anthony Cristiana Bavuso, Framingham, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1927; member of the Massachusetts Medical Society; aged 32; on the staff of the Framingham-Union Hospital, where he died, Dec. 30, 1934, of pneumonia.

Victor James Capron ✠ Friday Harbor, Wash.; Jefferson Medical College of Philadelphia, 1888; formerly member of the state board of health, state legislature, and mayor of Friday Harbor; aged 67; died, Nov. 16, 1934, in the Virginia Mason Hospital, Seattle.

Richard Theodore Bang ✠ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1879; formerly attending physician, outpatient department, New York Hospital; aged 79; died, January 16, of heart disease.

David Lauderdale Bryson, Calhoun Falls, S. C.; Atlanta College of Physicians and Surgeons, 1910; member of the South Carolina Medical Association; aged 52;; died, January 5, in the Anderson (S. C.) County Hospital, of cardiovascular renal disease.

Frank Cline Shipman, Jersey City, N. J.; New York Homeopathic Medical College and Flower Hospital, 1908; member of the Medical Society of New Jersey; aged 54; died, January 5, of hemorrhage resulting from carcinoma of the tongue.

William Wallace Kinkead, Nashville, Tenn.; Columbus (Ohio) Medical College, 1882; University of Tennessee Medical Department, Nashville, 1886; veteran of the Spanish-American War; aged 77; died, January 6, of carcinoma of the cecum.

Charles Henry Chesebro, Utica, N. Y.; University of the City of New York Medical Department, 1884; member of the Medical Society of the State of New York; aged 76; died, Dec. 14, 1934, of cerebral softening and arteriosclerosis.

Oreste Castagna, New York; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1901; member of the Medical Society of the State of New York; aged 57; died, January 14, of a self-inflicted knife wound of the heart.

Walter Scott Bell ✠ Elsie, Mich.; State University of Iowa College of Medicine, Iowa City, 1897; on the associate staff of the Clinton Memorial Hospital, St. Johns; aged 62; died, January 19, of carcinoma of the urinary bladder.

Daniel Francis Hochdoerfer, St. Louis; Beaumont Hospital Medical College, St. Louis, 1889; for many years coroner's physician; formerly of the staff of the Alexian Brothers' Hospital; aged 66; died, January 8, of carcinoma.

Joseph Parsons Comegys ✠ New York; College of Physicians and Surgeons, Keokuk, Iowa, 1890; Jefferson Medical College of Philadelphia, 1891; served during the World War; aged 69; died, January 20, of pneumonia.

Henry V. Byers, Newton, Iowa; Eclectic Medical Institute, Cincinnati, 1875; member of the Iowa State Medical Society; aged 86; died, January 5, in the Mary Frances Skiff Memorial Hospital, of heart disease.

Dexter Peter Cannaday, Roanoke, Va.; Medical College of Virginia, Richmond, 1905; member of the Medical Society of Virginia; aged 57; died, Nov. 11, 1934, of pneumonia, following perforated duodenal ulcer.

Warren Henry Hoey, Newton, Mass.; Harvard University Medical School, Boston, 1902; member of the Massachusetts Medical Society; served during the World War; aged 53; died, Dec. 31, 1934.

Cicero Holcomb Cox, Waynesboro, Ga.; University of Georgia Medical Department, Augusta, 1886; past president of the Burke County Medical Society; aged 68; died, January 17, of pneumonia.

Joseph Hector Bainton ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1901; on the staff of the Morrisania City Hospital; aged 59; died, January 7, of coronary occlusion.

Charles Thomas De Loach, Sarepta, La.; Memphis (Tenn.) Hospital Medical College, 1905; member of the Louisiana State Medical Society; aged 54; died, Dec. 25, 1934, of cerebral hemorrhage.

Addison Milton Rathbun, Rice, Minn.; Rush Medical College, Chicago, 1878; member of the Minnesota State Medical Association; aged 80; died, Dec. 13, 1934, of myocarditis and diabetes mellitus.

Francis Elgin Prewitt, Phoenix, Ariz.; Gross Medical College, Denver, 1898; formerly police surgeon in Denver; aged 66; died, Nov. 25, 1934, of cerebral hemorrhage and myocarditis.

Edward Harris ⊕ Cumberland, Md.; Hahnemann Medical College and Hospital of Philadelphia, 1902; aged 55; on the staff of the Memorial Hospital, where he died, January 22, of pneumonia.

William Woolsey Bellamy, Watertown, Mass.; Harvard University Medical School, Boston, 1902; member of the Massachusetts Medical Society; aged 57; died, January 17, of pneumonia.

Frederic Burton Cornell, Aurora, Colo.; College of Physicians and Surgeons, Baltimore, 1902; aged 58; died, January 16, in the Colorado General Hospital, Denver, of heart disease.

Foster Wand Burke ⊕ Laclede, Mo.; Marion-Sims College of Medicine, St. Louis, 1897; formerly secretary of the Linn County Medical Society; aged 60; died, January 3, of heart disease.

Robert Joseph Kirkwood Jr., Boston; Harvard University Medical School, Boston, 1925; served during the World War; aged 38; died January 3, of angina pectoris and coronary occlusion.

James Wesley Ellis, Owensboro, Ky.; Jefferson Medical College of Philadelphia, 1870; past president of the Kentucky State Medical Association; aged 88; died, January 4, of senility.

Lincoln Mock Bowman Alton, Ill.; Rush Medical College, Chicago, 1886; member of the Illinois State Medical Society; aged 74; died, January 9, of heart disease following pneumonia.

Watson H. Harwood, Chasm Falls, N. Y.; University of Vermont College of Medicine, Burlington, 1881; aged 80; died, Dec. 22, 1934, of heart disease and hypertrophy of the prostate.

Wilson David Forsythe New Concord, Ohio; Starling Medical College, Columbus, 1891; member of the Ohio State Medical Association; aged 75; died, January 12, of toxemia.

George W. Fleming, Petitcodiac, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1893; aged 72; died, Nov. 7, 1934, in Montreal, following a prostatectomy.

William O. Mabry, Goodman, Miss.; Memphis (Tenn.) Hospital Medical College, 1897; member of the Mississippi State Medical Association; aged 61; died, Dec. 27, 1934.

Chauncey Elder Kirk, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1894; aged 63; died, Dec. 29, 1934, in St. Joseph's Hospital, of chronic nephritis and uremia.

Valentine Hummel Fager ⊕ Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1892; aged 68; died, Dec. 22, 1934, of coronary thrombosis.

William Andrew Fulton, Burlington, Wis.; Rush Medical College, Chicago, 1893; member of the State Medical Society of Wisconsin; aged 66; died, January 26, of influenza.

William Homer Conklin, Ansonia, Conn.; University of the City of New York Medical Department, 1882; aged 74; died, January 11, of chronic myocarditis and nephritis.

Orrie Ianthas Hetsler ⊕ Blountsville, Ind.; Eclectic Medical Institute, Cincinnati, 1896; aged 63; died, January 19, in the Ball Memorial Hospital, Muncie, of pneumonia.

James Leslie Cannon, Toledo, Ohio; Medical College of Ohio, Cincinnati, 1901; served during the World War; aged 62; died, January 14, of carcinoma of the prostate.

Lemuel Hines, Mesilla Park, N. M.; Eclectic Medical Institute, Cincinnati, 1890; aged 69; died, January 10, at Tucson, Ariz., of coronary occlusion and angina pectoris.

Frank Edgerton Deeds, Sandusky, Ohio; Albany (N. Y.) Medical College, 1914; aged 44; died, January 17, in Winston-Salem, N. C., of pulmonary tuberculosis.

Frank Allen Augur, South Bethlehem, N. Y.; College of Physicians and Surgeons, Baltimore, 1886; aged 70; died, Dec. 2, 1934, of bronchopneumonia.

Frank Lightfoot ⊕ Great Bend, Kan.; Rush Medical College, Chicago, 1876; health officer; aged 84; died, January 7, in St. Rose Hospital, of myocarditis.

Anton George Frye, St. Louis; Universität Heidelberg Medizinische Fakultät, Heidelberg, Baden, Germany, 1884; aged 72; died, Dec. 24, 1934.

Julius C. Hoffman, Palo Alto, Calif.; Rush Medical College, Chicago, 1869; Civil War veteran; aged 86; died, January 4, of coronary occlusion.

Benjamin F. Bartho ⊕ Mount Carmel, Pa.; College of Physicians and Surgeons, Baltimore, 1887; bank president; aged 72; died, Dec. 30, 1934.

Emil Fenton, New York; New York University Medical College, 1896; aged 63; died, January 14, in the Post Graduate Hospital, of angina pectoris.

Otto Heber Jeppson, Salt Lake City, Utah; Northwestern University Medical School, Chicago, 1909; aged 59; died, January 20, of myocarditis.

William Arthur Meighen, Perth, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1901; aged 61; died, Dec. 27, 1934.

Bernard Miville Deschénes, St. Pascal, Que., Canada; Laval University Faculty of Medicine, Quebec, 1895; aged 65; died, Nov. 21, 1934.

Rudolph Fisher, Jamaica, N. Y.; Howard University College of Medicine, Washington, D. C., 1924; aged 37; died, Dec. 26, 1934.

John A. Ewing, La Vergne, Tenn.; Vanderbilt University School of Medicine, Nashville, 1893; aged 74; died, January 21, of heart disease.

Joseph Steven Dozier, Nashville, Tenn.; University of Nashville Medical Department, 1907; aged 62; died, January 9, of pneumonia.

Elizee Bellemare, St. Barnabe Nord, Que., Canada; School of Medicine and Surgery of Montreal, 1879; aged 81; died, Nov. 18, 1934.

Isaac W. N. Baker, Sussex, N. B., Canada; University of Vermont College of Medicine, Burlington, 1885; aged 73; died, Nov. 27, 1934.

George Stanton Hollister, Laton, Calif.; University of Michigan Medical School, Ann Arbor, 1892; aged 65; died, Dec. 27, 1934.

William T. Bell, Stoutsville, Mo.; Missouri Medical College, St. Louis, 1886; aged 76; died, January 17, of arteriosclerosis.

Clyde E. Ehinger, Keokuk, Iowa; Chicago Homeopathic Medical College, 1880; aged 76; died, January 3, of heart disease.

Francis Wong Leong, Honolulu, Hawaii; St. Louis University School of Medicine, 1908; aged 53; died, Oct. 10, 1934.

William C. Everett, Hazen, Ark. (licensed in Arkansas in 1903); aged 68; died, Dec. 28, 1934, in a hospital at Little Rock.

William S. Golden, Worthville, Ky.; Louisville Medical College, 1882; aged 76; died, January 18, of angina pectoris.

Cassius Harris Morgan, Higgins, N. C.; Tennessee Medical College, Knoxville, 1901; aged 58; died, Dec. 10, 1934.

George Revis, Sandy Hook, Va.; Medical College of Indiana, Indianapolis, 1901; aged 67; died, Nov. 29, 1934.

John C. Hafford, Black Oak, Ark. (licensed in Arkansas in 1903); aged 63; died, Dec. 22, 1934.

Correspondence

DANGERS OF TETANUS ON PUBLIC BEACHES

To the Editor:—In the instructive and interesting survey by Drs. Miller and Rogers of the present status of tetanus (THE JOURNAL, January 19, p. 186) I note the following passage: "Ordinary wounds acquired in the home or *in clean places* [italics mine], free from possible fecal contamination, or *while bathing at the shore* [italics mine], should not require the injection [of antitetanus serum]." Many medical practitioners have the experience, or at least the impression, that "shore" injuries are often complicated by tetanus. Few "metropolitan" beaches, if any, are free from possible fecal contamination. Wreckage containing rusty nails, wire and corroded metal, odds and ends of garbage and other jetsam and flotsam, broken clam shells and bottles, sharp stones, wood splinters, and so on, are present in abundance. Of thirty-three cases listed in abstract by the authors of the paper, nine at least gave a history of injuries such as might well have been received while in bathing or playing on the beach. Perhaps it might be the part of prudence to add "beach injuries" to the compound fractures, gunshot wounds, deep punctured wounds, "street wounds" and "farm wounds" that should all be treated prophylactically.

PERCY FRIDENBERG, M.D., New York.

INTRACAPSULAR FRACTURE OF THE HIP

To the Editor:—I note in the paper by Drs. Howard and Christophe on the treatment of intracapsular fracture of the hip at the Massachusetts Memorial Hospitals (THE JOURNAL, Dec. 15, 1934, p. 1833) that the purpose is to compare the end results of treatment by the "abduction double spica of Whitman with those of the traction methods of Ruth and Peckham." This suggests the following comments:

1. That there is no "Whitman double spica," since I have never used such an appliance.

2. That the abduction treatment is quite independent of the external appliance. It is in essence the utilization of anatomic mechanics to correct deformity and to oppose and fix the fragments. The function of ⅛ external splint is simply to support the limb in the altitude that assures the anatomic fixation; namely, complete abduction, complete extension and slight inward rotation. For this purpose plaster of paris is the only means generally available, and the long spica, which leaves the other limb free, is in my opinion the most comfortable and the most effective splint.

It may be noted furthermore that the abduction method is comprehensive in its scope, including the incomplete fractures of childhood, the epiphyseal separations and fractures at the base of the neck, as well as those with which the paper under consideration is directly concerned.

Finally, it has extended the range of effective treatment to extreme old age.

In this connection it may be noted that the death rate at the Massachusetts Memorial Hospitals (21.1 per cent) is far above the average of other statistics. Stern and his associates, for example, have reported seventy-seven cases of medial fracture treated by the abduction method in a Cleveland hospital. Twenty-eight of the patients were between 60 and 70 and seventeen were between 70 and 80, yet the mortality was but 7 per cent (*Surg., Gynec. & Obst.* **53**:250 [Aug.] 1931).

Formerly treatment of patients of this class was purely symptomatic, yet the mortality was high and I think it may be assumed that the death rate that can be attributed directly to treatment must be low.

I conclude that the relative advantages of the abduction treatment in the comprehensive range gets effectiveness and its practicability under all conditions are so obvious that one who has been trained in its application and in the further details of the treatment will find little occasion for substitutes.

ROYAL WHITMAN, Sunningdale, Berks., England.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

HIGH FAT DIETS IN GALLBLADDER DISEASE

To the Editor:—Are high fat diets beneficial to patients with gallbladder disease or stone? My question is prompted by the well known olive oil cure for gallstones. What is the opinion of competent authorities on this subject? Is it not a fact that high blood cholesterin will tend to increase the formation of stones because high fat feeding, especially with eggs, increases cholesterin? Please omit name.

M.D., Ohio.

ANSWER.—It is a common practice to forbid fats to patients with gallbladder disease. The ideas back of the practice are several. First, it is thought that with the lowering of cholesterol in the blood there will be less tendency to the formation of stones; second, that with the mechanism for the concentration and storage of bile out of order, the digestion of fats may suffer; and third that, actually, patients with gallbladder disease often do better if they avoid the eating of fat and particularly of large meals rich in fat.

It seems foolish to worry about the cholesterol content of the blood in patients with gallstones, because every pathologist and surgeon knows that in most cases it looks as if the stones had been formed at one time because they are all alike in color and composition. Only occasionally does it appear that there must have been two or three separate episodes in which stones of different types were formed. It seems then that the woman who gets two big gallstones perhaps during her first pregnancy at the age of, say, 22 years, will have these two stones and no more when she is operated on, say, at the age of 50 years. Under these circumstances it seems foolish to impose dietary restrictions with the hope of saving the woman with cholelithiasis from getting more stones. Besides, there is little reason for assuming that the acquisition of a few more stones would influence the clinical picture. So far as is known, it is the coming of infection that changes a "silent" gallbladder full of stones into a painful and menacing gallbladder.

The "well known olive oil cure" is really no cure at all; it is usually the device of a quack to collect money for the extrusion from the bowel of a lot of pellets of castile soap (made in the intestine from the olive oil), which are thought by the victim to be gallstones.

There is considerable evidence to indicate that women in many parts of the Orient seldom suffer with gallstones, and this has been thought to be due to a consumption of fat lower than that common in Europe or America. Actually, in the absence of exact information or of knowledge in regard to other possibly more important factors, these observations of missionary physicians and others cannot be stressed. It may be that the missionary doctor sees few gallstones because he rarely gets a chance to operate on or to perform necropsies on old women. They are too conservative and too fearful of the "foreign devil."

So far as we know, no one has been able to produce gallstones in man by feeding diets high in cholesterol. Some experiments on animals have shown that during the normal concentration of the bile in the gallbladder conditions might arise in which there would come an abnormal proportion between the concentrations of cholesterol and of bile acids. Under these conditions, stone-forming material might be precipitated. Others believe that infection is the most important factor, while others ascribe everything to stasis.

In the present state of experimental and clinical knowledge, the only conclusion seems to be that there is no logical diet for cholecystitis or cholelithiasis, and in actual practice no physician with an open mind and a large experience in this field would ever hope to put a stop to flare ups of cholecystitis by prescribing a diet. This may sound like black heresy to physicians in Europe who make their living at watering places by treating patients with cholecystitis, but any gastro-enterologist of experience knows that, commonly, these patients, after perhaps a temporary improvement due to rest, more careful eating and purgation, get into trouble again.

EXAMINING URINE FOR SUGAR

To the Editor:—Five cubic centimeters of qualitative Benedict's solution and eight drops of a urine specimen were boiled. The reaction showed no reduction. The urine specimen was sent to an out of town laboratory. A few drops of chloroform were added as a preservative. The report was positive for sugar. Will you please advise me whether presence of the chloroform was responsible for a positive reaction or whether it was due to decomposition of the urine or to both factors? What are other preservatives that can be used to avoid any possibility of false reports? Kindly omit name.

M.D., New York.

ANSWER.—In order to avoid decomposition of urine when it cannot be examined within twenty-four hours after being passed, many urinary preservatives have been recommended. But when not absolutely necessary it is better to avoid them. Urine kept in a cool place in a clean bottle can be examined even thirty-six hours after being voided.

The following preservatives have been used: salicylic acid, boric acid, chloroform, thymol, solution of formaldehyde, camphor, chloral hydrate, and corrosive mercuric chloride.

Chloroform added in small quantity to urine is a satisfactory preservative. But it must be known that its presence will lead to a pseudocarbohydrate reaction with qualitative Benedict's solution. The chloroform should be removed by heating the urine, and then the tests are not affected. In the case cited, the chloroform was undoubtedly the cause of the pseudoreaction.

Three or four drops of solution of formaldehyde may be added for each pint of urine. This is an efficient preservative but it will lead to reactions simulating sugar and even albumin, and also it forms a crystalline compound of formaldehyde and urea. Solution of formaldehyde also greatly interferes with the bile, urobilin and indican tests.

Thymol is a good preservative, but an excess may give a reaction similar to those for bile pigments, indican and albumin. The amount used should not exceed 0.1 Gm. for each hundred cubic centimeters of urine. Camphor, chloral and boric acid have been used, but they possess no advantages over the others. Boric acid may interfere with sugar determination. The examiner should be on his guard in reporting abnormal chemical action in a urine specimen to which a preservative has been added.

If it is desired to preserve a specimen of urinary sediment, the best method is to add from 2 to 5 drops of a 5 per cent chromic acid solution. The only change will be a coagulation of the albumin into a granular material. It will preserve all the features permanently, not even causing any changes in the casts. Hayem's solution is also an excellent preservative for urinary sediment.

DENTAL CARIES

To the Editor:—A certain family in my practice has three children, all of whom have teeth susceptible to early decay. The ages are 9, 8 and 6 respectively. They are representatives of the better class and their food is adequate in every respect. Only one indulges too much in sweets. Their teeth get constant personal and professional care. The mother has been advised by her dentist to use a proprietary combination of calcium phosphate and viosterol. As these children all drink an abundance of milk, I have told her that this is useless. She wants to know what can be done to prevent bad teeth in her children. These youngsters are above average in health and nutrition, although all three are asthmatic or potentially so. Is there any indication for calcium therapy when milk ingestion is ample? Could you suggest any method or treatment for this type of case?

JOHN HOWARD GREENE, M.D., Slab Fork, W. Va.

ANSWER.—A large amount of scientific evidence has of recent years accumulated which indicates that dental caries is essentially a dietary deficiency disease. Experiments carried out in orphan institutions where the complete diet was strictly under control show that the frequency of dental caries rises and falls with the increase or decrease of carbohydrates in the diet. In a small percentage of children caries was completely inhibited, in approximately 90 per cent of all the children the caries prevalence was markedly reduced, and in only a small percentage of cases did diet, apparently controlled, manifest no inhibiting influence. In still other cases it has been shown that some children remain immune, no matter how unbalanced the diet.

An adequate diet should be diversified, with a well balanced calcium-phosphorus ratio, along with a goodly amount of vitamins D and C.

While diet must be regarded as the one most important factor in susceptibility to caries, it is by no means the only one. Others are heredity, the glands of internal secretion, mechanical factors and oral hygiene. The significance of heredity and the glands of internal secretion are today but little understood. Irregularly occluding teeth are more frequently carious than those in normal occlusion. Oral hygiene is important only as far as caries is concerned in those individuals who are susceptible. Whenever Bacillus acidophilus is present in the mouth, caries also is found; without its presence, caries is never found. Even the most careful mouth hygiene cannot completely prevent caries when conditions of the mouth are favorable to the existence of Bacillus acidophilus, but it can materially limit its activity. The condition that permits Bacillus acidophilus to live in some mouths and not in others is not known, but it is assumed to be systemic. The glands of internal secretions may, of course, be responsible; their abnormal as well as normal functioning may be affected by diet.

In regard to these three children, the diet should be knowingly and dependably regulated. This is difficult to do in private families. The diet should contain at least a gram of calcium daily. Alkaline fruits and vegetables should be given preference to acid cereals. In addition, the meal should be ended with some hard food substance to exercise the jaws and cleanse the teeth mechanically. Eating between meals, if any, should be restricted to fruits. If results are still unsatisfactory, the glands of internal secretion should be suspected. The fact that these children are actually or potentially asthmatic suggests disturbed calcium metabolism. The glands are again assumed to be responsible. The administration of calcium and phosphorus is of doubtful value; if the diet is diversified, it usually contains ample amounts of these. The difficulty lies in the direction of improper assimilation.

POSSIBLE MOVEMENT OF CERVIX—INFECTION WITH GONORRHEA

To the Editor:—1. Some years ago I knew a young woman who during coitus had the ability to rub the cervix uteri to and fro, anteroposteriorly against the male glans, thus producing early orgasm. I have known of no similar case reported nor have I been able to find on inquiry among friends a like case. Is it unique? 2. On a certain day a man indulged in coitus with a woman who infected him with gonorrhea, as proved by his developing the disease after the ordinary incubation period. About twenty-four hours after the infecting contact the man had connection with a healthy girl. The result to this girl is not known to me. Did she possibly or probably contract gonorrhea? Please omit name.

M.D.

ANSWER.—1. During ordinary coitus the cervix makes various movements coming down to meet the penis, the external os opens and a suction action takes place to facilitate the entrance of the semen into the uterus. All this is purely reflex and involuntary. There are also many women, especially those of a passionate nature, who during coitus make all sorts of movements with the external genitals; but no instance has ever been recorded in which the woman could voluntarily move the cervix by itself either during coitus or otherwise. Either of the motions just described could easily be mistaken for such a condition.

2. As soon as a man is infected with gonorrhea, gonococci have entered his urethra, although it generally takes several days for these to multiply to sufficient numbers to cause the well known irritation and bring on the usual symptoms. But the gonococci are there at once after an infecting coitus, and it is more than likely that he would infect a third party even though his symptoms do not appear till much later.

LOW BLOOD SUGAR RECORDS

To the Editor:—A patient of mine, who took 55 units of insulin unwittingly at 6 p. m. and lapsed into coma about 9 o'clock was not treated until 11, when it required 70 cc. of 50 per cent dextrose intravenously to restore consciousness. Two blood sugar estimations by a competent technician were done on blood taken just before the dextrose was administered. Both readings were 14 mg. per hundred cubic centimeters. I am desirous of information regarding low blood sugar records and what the lowest record in the literature is. Please do not publish name.

M.D., Massachusetts.

ANSWER.—Any data regarding low blood sugar records should be accompanied by a statement of the method used. In general, older methods yielded higher values because of non-sugar reducing substances (partly glutathione). Newer methods, largely by use of different protein precipitants, give values that are lower and represent more nearly the true dextrose content of the blood. It seems possible that in severe hypoglycemia the dextrose in the circulating blood may approach zero. In such a situation the blood sugar determination with certain colorimetric methods may give values that are about 20 mg. per hundred cubic centimeters or somewhat lower, although accurate colorimetric readings are usually not possible. Without knowing the type of method used in the case described, one may only suggest that possibly the "blood sugar" of 14 mg. per hundred cubic centimeters represented non-sugar reducing substances. Determination after fermentation with yeast might have settled this point. Blood sugars "too light to read" are not uncommon, and the literature contains at least one report of a blood sugar said to be zero.

NUMBNESS OF LIP AFTER OPERATION

To the Editor:—In June 1931 I had an operation consisting of tonsillectomy and removal of polyps from the left maxillary sinus, the incision for the latter being made under the left side of the lip. Immediately after the operation I noticed an almost complete loss of sensation in the left half of the upper lip and in the left upper teeth. There was no motor paralysis of the lip. This condition improved slightly during the first year, but I have noticed very little change in the last two years. The sensation I now have is difficult to describe but can best be characterized as a combination of numbness and hyperesthesia. For example, food can collect between the lip and the teeth without my being aware of its presence there. I might add that the operation was performed by a very reputable man, who specializes in this type of work. The point in which I am particularly interested is the ultimate effect of this condition on the teeth involved. My dentist has checked the teeth every six months since the operation and has found none dead, but a much stronger electric current is required to produce a response in the teeth involved. I had roentgenograms made of these teeth two years ago, and their condition was good at that time. In your opinion, is there any chance for further nerve regeneration? Do you think that this condition will eventually necessitate the removal of these teeth? Please omit name.

M.D., Tennessee.

ANSWER.—The conditions described are doubtless due either to the operation or to the infection of the antrum, probably the former. No criticism of the operator is implied, as this is an occasional complication of even the most skilful surgeon's work. Further improvement in sensation after three or more years is improbable. As to the teeth, the prognosis is wholly favorable. The nerve supply of the pulps is not entirely confined to a single group of nerve fibers, and consequently it may be assumed that the teeth concerned are partially supplied with nerves. The life of the pulps of these teeth is dependent on an adequate blood supply and there is no reason to infer that this has been damaged in any way at all. There is no danger, therefore, that these teeth will have to be removed because of the postoperative complication described.

PREDOMINANT SEX IN HERMAPHRODITISM

To the Editor:—In hermaphroditism does one sex always predominate and function, while the other sex is rudimentary and incapable of function? Are there cases reported in which both sexes are rudimentary and incapable of function and vice versa?

BENJAMIN FLEISSIG, M.D., New York City.

ANSWER.—As a rule, one set of sexual organs predominates and the opposite sex is rudimentary. As an example may be mentioned a large clitoris having more or less the resemblance of a penis while the other female organs are well developed. As an opposite example may be mentioned a small penis accompanied with a scrotum that is more or less bifid, resembling the vulva, while the penis resembles the clitoris. But all gradations have been reported, varying from both sets of organs being rudimentary to (rather unusual) both sets of organs being perfectly developed.

IMMUNIZATION AGAINST SCARLET FEVER

To the Editor:—My own little girl, aged 7, had the five doses of scarlet fever toxin three years ago. This fall her Dick test shows a small area, 2 cm. of faint redness, which I read as positive. Five years ago she had three doses of diphtheria toxin-antitoxin. I gave her 1,000 units of diphtheria antitoxin, thinking I had possibly exposed her from my clothing. This fall her Schick test was very much positive. 1. Should she have a repetition of the five dose scarlet fever toxin? 2. Is she apt to be protein sensitive to the scarlet fever toxin on second administration? 3. What is your opinion of the aluminum precipitate toxoid (one dose)? 4. I do not want so much repetition, so will the one dose toxoid given during the five weeks necessary to complete the injections of scarlet fever toxin interfere with the development of immunity to either disease? 5. What can I tell my patients who inquire about the five dose scarlet fever toxin? I have been telling them that I think it worth the effort and expense but have recommended it rather guardedly.

H. D. KINDELL, M.D., New Richmond, Ind.

ANSWER.—1. She should have further immunization against scarlet fever. This may be accomplished by injection of the first, third and fifth immunizing doses of scarlet fever toxin at intervals of one week, omitting the second and fourth doses.

2. There is no foreign serum in scarlet fever toxin. Occasional individuals, particularly those who have had diphtheria toxoid, are sensitive to proteins in the ordinary broth used in the preparation of the toxin. In such persons 0.2 cc. of a 1:1,000 solution of epinephrine chloride taken up in the same syringe and injected with the toxin prevents disagreeable reactions.

3. The efficacy of the one dose of alum precipitated diphtheria toxoid is not yet established.

4. If the three doses of scarlet fever toxin suggested are used, only two weeks will be required, and it would be best to defer diphtheria immunization until after that period.

5. Some individuals retain immunity with greater difficulty than the majority and in these persons, as in the correspondent's daughter, it is usually found that there is a greater loss of immunity to diphtheria than to scarlet fever. The diphtheria as well as the scarlet fever immunization should be repeated. The tendency to loss of immunity in these individuals may apply also to smallpox.

Less than 10 per cent of persons immunized with the five doses of scarlet fever toxin lose enough immunity to require further immunization. However, these persons never become susceptible to the same degree they were in the beginning, so that if they received no further immunization and subsequently contracted scarlet fever the disease would not be as severe as it might have been without any previous immunization.

ROENTGEN THERAPY IN TERATOMA OF TESTIS

To the Editor:—I have a patient who had pain in the left testicle, beginning several days after a minor injury but too slight for concern. He was observed by several physicians for about ten weeks; no enlargement or other sign was noticed. He was finally given an Aschheim-Zondek test, which was positive. A second positive test was made several weeks later, and finally, one year ago, an orchidectomy was performed, which was about four months after the first signs, and without any preceding roentgen therapy. The pathologist's report was teratoma, no increase in size, and no involvement of the scrotum or cord. Superficial and high voltage roentgen therapy was started about ten days following the operation; the lungs were not included. The patient suffered a severe reaction, with pronounced gastro-intestinal disturbance, which has been followed by a colitis, persisting to date. There has been no other symptom or any abnormal condition. The patient has been greatly worried about his case, especially during the first few months following operation. The Aschheim-Zondek test has been consistently negative. The patient lost a few pounds during the hospitalization, and his weight has remained stationary. There is a difference of opinion as to the treatment of this case. The question arises whether or not further roentgen therapy should be given. Considering the negative tests and the nonfulminating nature of the lesion, what extra consideration does the colitis involve? Please omit name.

M.D., Indiana.

ANSWER.—In the absence of clinical evidence of disease, including roentgenologic examination of the lungs, and in the absence of a positive Aschheim-Zondek test, the consensus is that it is not advisable at this time to execute further roentgen therapy. There is some ground for difference of opinion on this position and some radiologists adopt the method of prophylactic irradiation at intervals over a long period in the absence of clinical recurrence. In this particular case the latter procedure is not advisable because the patient is apparently sensitive to radiation and developed a reaction following these treatments. Furthermore, if prophylactic irradiation is given in the absence of clinical evidence of disease, the areas that must be treated include such widely distributed sites as to render this procedure practically difficult to execute. Under the circumstances it is recommended that no radiation be administered at this time but that the patient be examined at frequent intervals, including x-ray films of the lungs and Aschheim-Zondek tests, and that treatment be deferred to such a time as clinical evidence of disease arises or when the Aschheim-Zondek test shows an increasing amount of hormone in the urine.

LEAD POISONING

To the Editor:—A local factory producing pigments is having trouble with lead poison, in spite of all the usual precautions being taken to avoid it. What would be the simplest and most accurate method for detecting minute amounts of lead in the blood of employees, so that they might be moved to other parts of the factory before symptoms develop? Would spectroscopic examination of the blood of employees at regular intervals be practical? A high calcium diet causes deposit of lead in the bones, while a low calcium diet with ammonium chloride favors its excretion. Would it be best for those necessarily exposed to lead but showing no symptoms to be on a high or low calcium diet during the time they are so exposed? In other words, would it be better to attempt to deposit lead in the bones as it is absorbed by a high calcium diet or to attempt to eliminate it constantly by a low calcium diet? I will appreciate any reference to the recent literature covering these points. Kindly omit name.

M.D., Pennsylvania.

ANSWER.—The best way to determine whether absorption of lead has occurred is to look for stippled red cells. For this a smear of blood should be fixed in methyl alcohol and stained with methylene blue either alone or followed by a light eosin stain, by which method the red cells appear either greenish blue or light red, powdered over with fine blue-black granules, which are sometimes clumped together. It is usually held that there should be more than 100 such cells per million to make a positive diagnosis and some authorities ignore anything under 500 per million, but for an indication of the beginning of lead absorption the physician will do well to accept the lower figure.

For men constantly exposed to lead but showing no symptoms of plumbism the administration of a high calcium diet (especially in the form of milk) to encourage storage in the skeleton has the sanction both of long practical experience with this old poison and also of the newer experimental studies. Following are references:

Cabot, R. C.: Clinical Examination of the Blood, ed. 5, New York, 1904, p. 419.
Naegeli, Otto: Blutkrankheiten und Blutdiagnostik, Berlin, 1919, p. 629.
Aub, Fairhall, Minot and Reznikoff: Lead Poisoning, Medicine Monographs, Baltimore, Williams and Wilkins Company **7**, 1926.
Aub, J. C.; Robb, G. P., and Rossmeisl, Elsie: The Significance of Bone Trabeculae in the Treatment of Lead Poisoning, *Am. J. Pub. Health* **22**: 825 (Aug.) 1932.
Belknap, E. L.: Lead Poisoning: The Diagnosis and Treatment of Its Most Toxic Episode, Lead Colic, *Wisconsin M. J.* **28**: 346 (Aug.) 1929.

ERUPTION ON AURICLE

To the Editor:—May I trouble you for a little help in regard to a woman patient, aged 24, who has an eczematous circle just back of the auricle? The inflammatory area is about 10 mm. wide and extends the entire length of the ear. Scales form and there is constant itching unless some remedy is applied to relieve it. Examination of the urine is negative. The general health of the patient is good, except that she has some catarrh. An examination of the nasal passages was negative. She has some dandruff in the hair, but not sufficient to be thought the cause of the eczema. All the usual remedies have been tried, including ultraviolet rays. I presume you would want further data for diagnosis but the fact is that all tests have been negative. It is now some three years since the area of redness appeared and it is constantly becoming more annoying. Kindly omit name.

M.D., Ohio.

ANSWER.—It is assumed that there is only one patch of itching, scaly dermatitis. It is referred to as a circle, but this may mean only that it is oval, not clear in the center. The diagnosis rests in all probability between ringworm and lichen simplex. The scales should be examined for a fungus by soaking them for seventy-two hours in 10 per cent potassium hydroxide solution and examining with the high dry lens. If a fungus is found, half strength tincture of iodine should be applied once daily until irritation begins or until the stain becomes too evident, when Whitfield ointment, 3 per cent of salicylic acid and 6 per cent benzoic acid in ointment of rose water may be applied once a day.

If by a circle is meant a round or oval patch, the probable diagnosis is lichen simplex, kept up by rubbing or scratching. Only energetic measures will avail. X-rays and radium can be used only in the mildest dosage within the hairy scalp. Ultraviolet rays applied to cause vesiculation may be used, or graduated strengths of cresolic acid in alcohol, painted on once a week, in strength sufficient to cause scaling.

HOMOSEXUALITY AND MENTAL DEFECT AFTER ENCEPHALITIS

To the Editor:—A boy, now 14, who had encephalitis complicating pneumonia when a few months old and has failed to develop normally, either mentally or physically, in the interval, in spite of the best of attention and care, is now showing a propensity to homosexuality. There now remains no doubt that during the past year he has engaged in the act not only with smaller boys but with men as well. Knowledge of the situation first came from some individuals he had solicited on the street and who knew him. His parents are now aware of his condition and are keeping him under complete surveillance, having withdrawn him from school. What can be done with such a case from a medical and from a social standpoint? Where can I obtain reliable literature on the problem? Please omit name and address.

M.D., Tennessee.

ANSWER.—It would particularly be important to know the degree of mental defect and in what way the physical development is lacking. One must not assume offhand that this boy is a true sexual invert. Being defective, he may accidentally have been inducted into homosexual practices. In his "Psychopathia Sexualis" (twelfth English edition, p. 286) Kraft-Ebing describes how masturbators may acquire fondness for such practices, often on account of external circumstances, and a defective boy is more likely to do this. Homosexuality has been mentioned among the sequels of epidemic encephalitis, for instance by Rudolph Neustadt (Die kronische Encephalitis epidemica, Leipzig 1932, p. 11). E. P. Bleuler (*J. Nerv. & Ment. Dis.* **71**:361 [April] 1930) believes that homosexuality is curable in certain cases, and the same opinion was held by the late Emil Kraepelin. Unless this boy is sufficiently defective to be eligible for the ordinary institution for defectives, he may possibly fit in the special institution for encephalitic behavior disorders described in a monograph by Earl D. Bond and Kenneth E. Appell: The Treatment of Behavior Disorders following Encephalitis, New York, 1931. The boy ought to be examined by a psychiatrist with child guidance experience.

CHRONIC MICROCYTIC ANEMIA

To the Editor:—I am at a loss to classify the type of anemia of the following case and would appreciate greatly any help: A quadripara, aged 39, complains of sore mouth, weakness and some shortness of breath. The duration of these symptoms is indefinite, the onset having been gradual, but she thinks about one year. She has no sensory disturbances. The patient is very nervous and apprehensive about her condition. The positive changes on examination are: lemon yellow color to skin, smooth glossy tongue, lips very pale, finger nail beds of poor color. Blood count showed: hemoglobin, 55 per cent (Dare); red blood cells, 3,700,000; white blood cells, 7,750 (patient menstruating). Smears showed: polymorphonuclears, 70 per cent; single lobed neutrophils, 3 per cent; lymphocytes, 15 per cent; eosinophils, 8 per cent; transitionals, 4 per cent. Erythrocytes showed microcytes present, macrocytes present, poikilocytes present, basophilic degeneration present; 17 were reticulocytes found in two lengths of slide. Platelets seemed to be increased in numbers. A gastric examination was tried, but the patient insisted that she could not swallow the tube. However, since the time she has been on diluted hydrochloric acid her mouth is not so sore and she is able to taste her food better. Present treatment consists of diluted hydrochloric acid (15 drops with meals) and lextron (Lilly) four drops three times a day. Suggestions as to both diagnosis and treatment will be greatly appreciated. Kindly omit name.

M.D., Pennsylvania.

ANSWER.—The anemia appears to be of the iron deficiency type, such as occurs in women who have profuse loss of blood during their periods, but who, possibly because of a deficient secretion of hydrochloric acid, have difficulty in utilizing the iron of their food. Each period causes an increased loss of blood, without adequate restitution in the intervals. This type of anemia is sometimes called chronic microcytic anemia or idiopathic hypochromic anemia. Iron must be given in large doses (e. g., reduced iron, 0.5 Gm. in capsules, three times a day, after meals). Dilute hydrochloric acid (U. S. P.) may be given in 4 cc. doses in a glass of water with each meal. If there is abnormal bleeding, the cause must be removed if possible.

POSTOPERATIVE RECURRENCE OF CYSTOCELE

To the Editor:—I have observed early recurrence after an operation for a large cystocele. In quite a number of such operations I never had this experience. Is it difficult to find a cleavage plane between the vaginal wall and the bladder at a secondary operation? Is there any technical advice that I could use to advantage? Please omit name and address.

M.D., New York.

ANSWER.—Postoperative recurrence of cystocele is not common except following subsequent pregnancy and delivery. Recurrence is usually due to insufficient correction of an associated uterine prolapse. There is no fixed method for subsequent operations for its correction, and the type of operation to be performed depends on whether the patient is in the childbearing period or beyond the menopause. If in the former period, plastic repair should be done together with some type of internal shortening of the round and uterosacral ligaments. If the menopause has occurred, an operation of permanence should be done. In case there is considerable prolapse, a Mayo vaginal type of hysterectomy and perineorrhaphy is the operation of choice. Should there be a large cystocele without much prolapse, a Watkins interposition operation should be performed, provided the uterus is of normal size.

DUPUYTREN'S CONTRACTURE

To the Editor:—A girl, aged 5 years, was stricken with acute anterior poliomyelitis and survived with a rather marked residual paralysis of both lower extremities and with only slight atrophy of the muscles of the hands. After eight years the legs have shown no improvement but the hands have improved to the point at which the child learned to play the piano and could write quite well. At the age of 14 she was exposed to scarlet fever, and a prophylactic dose of antiscarlatinal serum was administered by a physician who was not informed of the child's sensitivity to horse serum. No serum reaction was noted, for the child contracted scarlet fever soon after the injection. After a stormy convalescence the fingers of both hands, particularly the third phalanges, were found to be spastically flexed in a clawlike fashion. This flexion has persisted, resulting in the child having to give up the piano and making writing very difficult for her. What, from the facts stated, might possibly have precipitated the present condition of her fingers? What is the prognosis? Kindly omit name and address.

M.D., New York.

ANSWER.—The history has some points of resemblance to Dupuytren's contracture. There may be fascitis, myositis or tendonitis.

There is evidently a postural, a toxic and a chemical factor involved in this case.

Any infection or chemical reaction may produce a contracture. Deformity is frequently the price paid for comfort during the acute stage of any illness.

The various factors in the treatment include adjustable splints, physical therapy including heat, massage and hot paraffin dips, and operations such as capsulorrhaphy or capsulotomy and tendon plastic procedures.

Medical Examinations and Licensure

COMING EXAMINATIONS

ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Juneau.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B candidates).* The examination will be held in various cities of the United States and Canada, March 23. *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. Group B application lists close Feb. 23 and Group A application lists close May 10. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. *Application must be filed at least sixty days prior to date of examination.* Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 10, and St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

ARIZONA: *Basic Science.* Tucson, March 19. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CALIFORNIA: *Reciprocity.* Los Angeles, March 13. Sec., Dr. Charles B. Pinkham, 420 State Office Building, Sacramento.

CONNECTICUT: *Regular.* Hartford, March 12-13. *Endorsement.* Hartford, March 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* March 12. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

IDAHO: Boise, April 2. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 203 State House, Boise.

ILLINOIS: Chicago, April 9-11. Superintendent of Registration, Department of Registration and Education, Mr. Eugene R. Schwartz, Springfield.

MAINE: Portland, March 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton Jr., 192 State St., Portland.

MASSACHUSETTS: Boston, March 12-14. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 144 State House, Boston.

MINNESOTA: *Basic Science.* Minneapolis, April 2-3. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

MONTANA: Helena, April 2. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. P. G. Cornish Jr., 221 W. Central Ave., Albuquerque.

OKLAHOMA: Oklahoma City, March 12-13. Sec., Dr. J. M. Byrum, Mammoth Bldg., Shawnee.

PUERTO RICO: San Juan, March 5. Act. Sec., Dr. Ramón M. Suarez, Box 536, San Juan.

WEST VIRGINIA: Charleston, March 18. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

WISCONSIN: *Basic Science.* Madison, March 16. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

North Carolina June Examination

Dr. Benjamin J. Lawrence, secretary, North Carolina State Board of Medical Examiners, reports the written examination held in Raleigh, June 19-23, 1934. An average of 80 per cent was required to pass. Seventy-three candidates were examined, all of whom passed. Thirty-two physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine		(1927)	88
Georgetown University School of Medicine		(1934)	92.9
Howard University College of Medicine		(1933)	86.4, 86.9, 93.1
Emory University School of Medicine		(1934)	85, 85.4, 86.6, 87.9
University of Georgia School of Medicine		(1934)	95
Rush Medical College		(1934)	85
Tulane University of Louisiana School of Medicine		(1933) (1934)	94, 88, 88.1, 89.1, 91, 93.3
Johns Hopkins University School of Medicine		(1932) (1934)	90, 90.3
University of Maryland School of Medicine and College of Physicians and Surgeons		(1934)	83.1, 85.7, 86.9, 88.1
Harvard University Medical School		(1934)	90.3
Washington University School of Medicine		(1934)	86.6
New York University, University and Bellevue Hospital Medical College		(1934)	86.3, 91.3, 92.7
Duke University School of Medicine		(1932) (1933) (1934)	91.7, 93, 90
Jefferson Medical College of Philadelphia		(1931) (1934)	92, 81, 82.9, 86.3, 86.9, 87.1, 89.9, 94.4, 94.6, 96.3
Temple University School of Medicine		(1932) (1933) (1934)	89.1, 88.1, 89.4, 86.1, 89.7, 91.3
University of Pennsylvania School of Medicine		(1928) (1934)	88.7, 85.6, 91.3, 91.4, 91.6, 92, 92.1
Medical College of the State of South Carolina		(1933) (1934)	87.4, 85.6, 88.9, 90.1, 90.7
Meharry Medical College		(1933)	85.6
Vanderbilt University School of Medicine		(1934)	90.3
Medical College of Virginia		(1934)	85, 85.6, 87.1, 87.4, 87.6, 89.9, 90, 90.6, 91.1, 91.3, 93.4
McGill University Faculty of Medicine		(1934)	85.7

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
George Washington University School of Medicine		(1914)	Dist. Colum.
Atlanta College of Physicians and Surgeons, Georgia		(1912)	Georgia
Northwestern University Medical School		(1899)	Illinois
Rush Medical College		(1929)	N. B. M. Ex.
Louisiana State University Medical Center		(1934)	Louisiana
Tulane Univ. of Louisiana School of Med.		(1920), (1933) (1932)	Alabama, Louisiana
Johns Hopkins University School of Medicine		(1929)	Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons		(1932), (1934)	Maryland
Harvard University Medical School		(1928) (1931)	N. B. M. Ex., Michigan
University of Minnesota Medical School		(1933)	Minnesota
Columbia Univ. College of Physicians and Surgeons		(1926)	N. B. M. Ex.
New York University Medical College		(1894)	Illinois
University of Rochester School of Medicine		(1932)	N. B. M. Ex.
Jefferson Medical College of Philadelphia		(1924)	Illinois
University of Pennsylvania School of Medicine		(1933)	Virginia
Woman's Medical College of Pennsylvania		(1932)	N. B. M. Ex.
Medical College of the State of South Carolina		(1932)	S. Carolina
Meharry Medical College		(1932)	Georgia, Tennessee
University of Tennessee College of Medicine		(1923) (1930), (1931, 2)	Georgia, Tennessee
Vanderbilt University School of Medicine		(1931)	Tennessee
Medical College of Virginia		(1930), (1931), (1933, 2)	Virginia

Maine November Report

Dr. Adam P. Leighton Jr., secretary, Maine Board of Registration of Medicine, reports the written examination held in Portland, Nov. 13-14, 1934. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Seventeen candidates were examined, all of whom passed. Two physiciars were licensed by reciprocity. Two physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1934)	82.2
Loyola University School of Medicine		(1934)	82.8*
Medical School of Maine		(1914)	82.5
Boston University School of Medicine		(1932) (1933)	88.8, 84.5, 85.7,
Harvard University Medical School		(1892) (1934)	75.3, 87.1, 87.3, 88.2
Tufts College Medical School		(1926) (1934)	83.1, 84.4, 82.8, 83.8
Hahnemann Med. College and Hospital of Philadelphia		(1934)	83.9

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Western Reserve University School of Medicine		(1930)	Ohio
University of Tennessee College of Medicine		(1919)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Tufts College Medical School		(1933)	N. B. M. Ex.
New York University, University and Bellevue Hospital Medical College		(1933)	N. B. M. Ex.

* This applicant has completed his medical course and will receive his M.D. degree on completion of internship. License is being withheld.

Montana October Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held in Helena, Oct. 2-3, 1934. The examination covered 10 subjects and included 50 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. Nine physicians were licensed by reciprocity and 3 physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Creighton University School of Medicine		(1933)	81.6
University of Alberta Faculty of Medicine		(1932)	82.7

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Denver and Gross College of Medicine, Colorado		(1904)	Indiana
Northwestern University Medical School		(1930)	Minnesota
Rush Medical College		(1926) (1932)	Minnesota, California
University of Michigan Medical School		(1930)	Michigan
University of Minnesota Medical School		(1929)	Minnesota
St. Louis College of Physicians and Surgeons		(1903)	N. Dakota
Creighton University School of Medicine		(1927)	Nebraska
University of Wisconsin Medical School		(1932)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1933)	N. B. M. Ex.
University of Minnesota Medical School		(1933)	N. B. M. Ex.
Columbia Univ. College of Physicians and Surgeons		(1929)	N. B. M. Ex.

Book Notices

Nutrition and Disease: The Interaction of Clinical and Experimental Work. By Edward Mellanby, M.D., F.R.C.P., F.R.S., Consulting Physician, Royal Infirmary, Sheffield. Cloth. Price, 8/6. Pp. 171, with 65 illustrations. Edinburgh & London: Oliver & Boyd, 1934.

This book presents the substance of a series of lectures delivered before the Royal College of Physicians in June 1933. It describes some of the problems that the author investigated while holding the combined laboratory and clinical post of professor of pharmacology, University of Sheffield, and consulting physician of the Royal Infirmary, Sheffield, England. The lectures attempt particularly to point out how the combined experiences of the laboratory and the ward or clinic interact in furthering medical science. With this end in view, the author shows how observations of disease in human patients have stimulated research on animals, and how these laboratory observations have in turn been carried back to the ward for testing on human subjects. It is only through such mutual interaction, he believes, that the problem of nutrition in relation to disease can be solved.

Five main topics are covered in the lectures: (1) rickets, (2) dental structure and disease, (3) simple and toxic goiter, (4) nutrition and infection, and (5) nutritional influences on the nervous system. The report on rickets describes the author's early work in producing this disease experimentally in dogs, his discovery that cereals are rickets producing and that a fat-soluble vitamin is rickets preventing, and follows the high spots in the rapid development of knowledge of this subject to the present time. Emphasis is given to the author's view that cereals, oatmeal in particular, contain an anticalcifying substance, a toxamin, which may be counteracted by calcium salts, by boiling the cereal in dilute acid, or by vitamin D in any of its manifold forms. Reference is made to the finding by Györgi that maize has a more pronounced effect than oatmeal and to unpublished work of Bruce and Callow that phytic acid may be the toxic substance involved. Although this theory of an anticalcifying factor in cereals is not universally accepted, the majority of research workers believing that a deficiency of vitamin D, an unbalanced calcium: phosphorus ratio or other factor interfering with calcium utilization is sufficient to account for rickets without postulating a toxic factor, the difference in point of view is of academic rather than practical importance, since both groups recognize that, whatever the fault, it may be corrected by including a source of vitamin D in the diet. To this Mellanby would add the restriction of the cereal intake.

The lecture on dental structure and disease presents in a brief fifteen pages the gist of Mrs. Mellanby's extensive investigations from 1917 to the present time on the factors determining tooth structure, incidence of caries and other dental disease, and practical methods for their prevention and control. Evidence is presented from laboratory work on animals and studies of human teeth to show that all types of faulty structure may be produced at will in animals by making slight changes in the diet; that there is a close correlation in human teeth between structure and caries—that is, that teeth of bad structure tend to be more carious than those of good structure, and that the resistance of the teeth, regardless of their original structure, may be increased by feeding diets good in calcifying properties, through building up of secondary dentin, and that carious areas may even be arrested or healed by this means. Pyorrhea, moreover, may be induced or prevented by the absence or presence in the diet of determining dietary factors. The diet that produces normal tooth development and prevents or arrests caries is the same as that which prevents rickets, namely, one rich in calcium and phosphorus and vitamin D and low in cereals, while vitamin A is held to control the development of the gingival epithelium, and a deficiency of this factor, therefore, favors the development of pyorrhea. There is, of course, a whole school of workers who would present an entirely different theory of dental decay with evidence to support it; e. g., the one of which Bunting is a chief exponent. Again, however, the disagreements are largely in respect to the mode of action rather than in the practical applications, for the diets advised by the opposing schools for tooth protection are essentially the same.

The section on the thyroid reviews the history of thyroid physiology and especially the work of Marine and others on the relation of iodine to simple and toxic goiter. A summary of the experimental and clinical evidence from his own as well as other laboratories seems to the author to support the view that, although there is a close resemblance microscopically between simple and toxic goiters, their etiology is fundamentally different. "The simple goiter is due primarily to a deficiency of iodine in the body, whereas the toxic goiter is caused mainly by some mechanism pulling out the colloid with its active principles, as soon as it is formed, into the general circulation and thus producing a local absence in the gland itself, and an excess in the blood. Both mechanisms produce thyroid hyperplasia. There is good evidence that the mechanism responsible for the withdrawal of the thyroid colloid involves a chemical substance in the anterior part of the pituitary gland. The deficiency of iodine which leads to simple goiter is primarily dietetic, especially in early life and the period of growth." The author presents evidence that has led to these conclusions and discusses their relation to the prevention and treatment of both types of goiter.

The discussion on nutrition and infection seems an unusually able and fair presentation of this debated subject. The author points out the difficulties involved owing both to inadequate methods of judging nutrition and to varied conceptions of what is meant by "infection." He shows how almost invariably workers with rats have demonstrated extreme susceptibility of vitamin A deficient rats to infections especially of the respiratory tract and the less clear-cut results in human beings. He points out that results as found in animals would not be expected in human subjects, because few diets even of the very poor are as deficient in vitamin A as are given experimental animals. It is known, however, that the poor, whose diets tend to be low in the protective foods, do have a higher incidence of the type of infection related to dietary deficiencies than do the higher economic groups. Clinical and experimental evidence from the author's laboratory and elsewhere is presented which shows that "in some infective disorders of the mucous membranes affecting human beings vitamin A raises the resistance and diminishes the incidence and severity of such disorders" (e. g., puerperal sepsis, measles). On the other hand, evidence is also given to show that "infection foci of the type seen in vitamin A deficient animals develop in human beings independent of the vitamin A reserves and therefore may have a different aetiological significance." The author believes very definitely then that vitamin A is one factor at least in the body's defense against infections, especially those involving epithelial tissues, but he realizes also that there are other factors concerned, and he expresses himself as "prepared to use every available weapon which promises to lead to further knowledge."

The two lectures on nutrition and the nervous system deal with vitamin A in a newer rôle in relation to nervous disorders. It is shown through experimental evidence that widespread nerve degeneration results from a vitamin A deficiency and that nerve changes are found in xerophthalmia, night blindness and retrobulbar neuritis and may be the primary factor in these conditions and possibly also in other infective foci found in vitamin A deficient animals. The theory is also advanced that a vitamin A deficiency is wholly or in part responsible for the degenerative nervous changes found in a variety of diseases or conditions that were formerly attributed to other factors; namely, beriberi, convulsive ergotism, pellagra, lathyrism, and other conditions. In some of these, as in ergotism and lathyrism, a neurotoxin also is involved but vitamin A or carotene will prevent the changes and the accompanying clinical manifestations. The author admits that much additional work is needed to clarify this problem, but he believes that "the present work suggests not only a new field of possibilities in the way of treatment which is worthy of study but that, in the diseases referred to above, specific dietetic influences will prove to be of great importance, certainly as prophylactic agents, and to a less degree as a curative means."

This book is an excellent, concise presentation of the author's work and conclusions in a number of important fields of nutrition research. The conclusions expressed are in the main those commonly held by research workers, but some represent interpretations for which the author is at present the chief exponent.

As one reads through the entire text the points that stand out are the author's conviction that cereals have a definite antagonistic action in many aspects of human nutrition, and his strong belief in the dominating rôle assumed by vitamin A in the prevention of disease through its protective action both on the epithelial tissues and on the nervous system. The point of view and the supporting evidence should stimulate to further research in these fields.

Protoplasma-Monographien. Herausgegeben von R. Chambers und anderen. Band VII: Pathologie der Mitose. Von Georg Politzer, Privatdozent der Embryologie an der Wiener Universität. Cloth. Price, 16.20 marks. Pp. 238, with 113 illustrations. Berlin: Verlag von Gebrüder Borntraeger, 1934.

A complete survey of the abnormalities occurring in cell division is contained in this monograph. The interest in the subject lies not only in the biologic aspect in that mutations are now being produced in large numbers in the fruit fly Drosophila by irradiation but also because it is undoubted that the action of x-rays, radium, cathode rays and ultraviolet rays is in part at least on the division mechanism of the cells. Certain of the theories of the origin of cancer which have been proposed in recent years assume that changes in the chromosomes may lead to the production of new races of cells, which possess the capacity of unlimited growth, and large series of studies have been devoted to the investigation of the morphology of the mitotic figures and the number of chromosomes in cells of malignant neoplasms. All of this is excellently surveyed and the reader who wishes to extend his knowledge will find a useful and complete bibliography appended. There are also drawings, photomicrographs and charts.

Practical Surgery of the Abdominal and Pelvic Regions. By James William Kennedy, M.D., F.A.C.S., Surgeon-in-Chief to the Joseph Price Hospital, Philadelphia. Second edition. Cloth. Price, $7.50. Pp. 861, with 133 illustrations. Philadelphia: F. A. Davis Company, 1934.

This book was inspired by a student's love for his great master, Dr. Joseph Price, the author acting as an exponent of principles endorsed by his predecessor, particularly those which are at variance with the popular teachings. The chapters have been arranged in a haphazard manner; for instance, a chapter on ligature and suture material is preceded by one on inguinal hernia and followed by one on surgery of ovarian cysts. The eulogy of Dr. Price is carried to extremes and includes a hyperbolic statement that "probably no operator living or dead was more the master of difficult and trying major abdominal work than Dr. Price." Some statements are contrary to the experience of other surgeons, others will be met with astonishment. Appendectomy in form of a stumpless removal of the organ is advocated irrespectively of the stage of peritoneal involvement; adhesions should be broken and the appendix removed in every instance; the author has probably an unrivaled record of "a good many thousands of appendectomies without a single death in cases where drainage was not necessary." He also established an enviable record of a mortality of 0.2 per cent after vaginal hysterectomy by the clamp method. The correctness of the statement that vaginal hysterectomy has the lowest operative mortality of any major operation will not go unchallenged. The author must be a second Houdini, as in 90 per cent of the cases he performs a vaginal hysterectomy in less than five minutes (p. 15). He feels justified in promising a successful repair of the perineum in practically 100 per cent of the cases. On page 278 he says that no harm follows penetration of the rectum while repairing the perineum. According to his experience, the very ill patients from gonorrheal infection stand surgery well. The gangrenous gallbladder should be drained, not removed. Trendelenburg's position, retractors and rubber gloves are tabu in abdominal surgery; absorbable material is never used; through and through sutures are employed as a routine for closure of abdominal incisions. Lest we forget, the author reminds us countless times of his eleven years long apprenticeship with Dr. Price. The style and punctuation justify a suspicion that Gertrude Stein acted as a collaborator. A few quotations may corroborate this statement. The description of figure 32 reads as follows: "Fig. 32 illustrates the popular method of tying the meso-appendix which is incorrect in that it does not include the proximal vessels to the point of transfixion with a blunt instrument as a ligature carrier such as the hemostat and thus the bleeding which might take place from the vessels which are not included within the ligature. The error is in the use of a blunt instrument such as a hemostat by which the ligature is carried through the meso-appendix too far from the ceco-appendiceal angle which ligature does not include the most proximal vessels which are often the largest and nourish the proximal end of the appendix which becomes the stump of the incomplete operation." Practically every statement throughout the book is repeated several times. "Tubercular" is used instead of "tuberculous"; "tenaculae" instead of "tenacula"; one finds such expressions as "the fibroid patient" (p. 15), "the pathological surgeon" (p. 105) or a sentence: "classify the lesion into operative and non-operative hours" (p. 100); "I do not approve clamping any vessels if it can be avoided which later must be tied" (p. 532). It is highly regrettable that such inexcusable shortcomings detract considerably from the value of the book, which is exceptionally well illustrated and replete with interesting discussions.

L'épaule: Anatomie des formes extérieures, anatomie radiographique, chirurgie opératoire. Par Antoine Basset, professeur agrégé à la Faculté de Paris, et Jacques Mialaret, interne des hôpitaux de Paris. Paper. Price, 65 francs. Pp. 292, with 116 illustrations. Paris: Masson & Cie, 1934.

This book forms the second link in a series of monographs on normal anatomy and operative technic of articulations, the first being a monograph on the knee; a book on surgery of the ankle will soon follow. The first part of the book gives a thorough description of the normal appearance of the shoulder region as observed in the course of a clinical examination, and a detailed description of the roentgenographic appearance of a normal shoulder follows. This chapter is supplemented by an unusual and instructive feature in the form of drawings in which ligaments, tendons and muscles are sketched over roentgenograms. Finally, roentgenograms of injected synovial sacs and arterial trees are reproduced. The second part of the book is subdivided into several chapters discussing the most popular avenues of approach to the shoulder articulation, the treatment of penetrating wounds and suppurative arthritis, the surgical treatment of fractures of the upper portion of the humerus, surgery of dislocations of the shoulder, arthrodesis, surgical treatment of tuberculosis, ankylosis, intradeltoid amputation, and exarticulation of the shoulder. The monograph is complete, well planned and not too verbose. The subject is presented in a clear, simple, concise manner. There are many beautiful roentgenograms, reproductions of photographs, diagrams and schematic drawings. The work is not a simple compilation of data; the authors carefully describe various methods in vogue but express their own views on many controversial subjects. Certain omissions have been noticed; for instance, the technic of local anesthesia has not been described as apparently it is not in favor with the authors. American literature received due consideration; e. g., Nicola's and Fowler's methods of operation for recurrent dislocation of the shoulder are discussed by the authors; generally speaking, however, bibliographic references are sadly inadequate for the amount of material covered in the text and there is no index of the literature. The book may be highly recommended to general and orthopedic surgeons, even those not well versed in the French language, as the illustrations talk for themselves.

Aids to Osteology. By Philip Turner, B.Sc., M.B., M.S., Consulting Surgeon, Guy's Hospital, London. In collaboration with N. L. Eckhoff, M.S., F.R.C.S., Assistant Surgeon, Guy's Hospital. Third edition. Cloth. Price, $1.50. Pp. 222. London: Baillière, Tindall & Cox; Baltimore: William Wood & Co., 1934.

The nomenclature recommended by the Anatomical Society has been adopted throughout this edition. It is about thirty pages longer than the preceding edition, and a revision of the text has been made by Mr. N. L. Eckhoff. The subject is treated under the headings of bones of the upper extremity, lower extremity, spine and thorax, and skull. A description of each individual bone is offered, giving its location, shape, articulations and attachments of muscle and ligaments. This book, while devoid of illustrations, offers a useful and accurate guide to the student or practitioner in quest of descriptive information about the various bones of the skeleton.

Medicolegal

"Public Hospital" Defined.—The defendant operated a hospital in Minnesota which she claimed came within a constitutional provision exempting public hospitals from taxation. The constitutional provision provided as follows:

> . . . Public burying grounds, public school houses, public hospitals, academies, colleges, universities, and all seminaries of learning, all churches, church property and houses of worship, institutions of purely public charity, and public property used exclusively for any public purpose, shall be exempt from taxation. . . .

During the year in question, 1931, the evidence showed that the hospital was conducted as an "open hospital," all physicians and patients being admitted on equal terms. The county sent to the hospital all patients who were public charges and paid therefor at a fixed rate. The hospital was conducted at a loss, although the defendant testified that she would not have refused to make a profit had it been possible. There were no charity beds in the hospital. A charge was made to all physicians for operating in the hospital and a regular charge was made to all patients. The defendant had full control and management of the hospital and had power to determine who should or should not be admitted and what doctors should or should not use the hospital. The trial court found that the institution was not a public hospital and the defendant appealed to the Supreme Court of Minnesota.

The word "public," said the Supreme Court, may be variously defined. It may be defined as meaning open for the use, enjoyment, and the participation of the public generally, even though a fee is charged, as a public dance hall, a public carrier, etc. It may be defined as meaning owned by the public, that is, by the government or some of its subdivisions, as a public building, public court house, etc. It may in certain situations be defined as meaning operated for the benefit of the public rather than for the benefit of a private individual. It is quite evident, continued the court, from a consideration of the entire constitutional provision, that it was not intended to confine exemptions from taxation only to property owned by the public. It is unreasonable to suppose that mere access to, use of, or patronage by the public is the sole and only test of whether property is exempt under the provision of the constitution. In using the words "public hospital," the court said, the framers of the constitution and the voters meant first that there should be free access to the public without discrimination in order that a hospital may be a public hospital. It was further intended that a public hospital also should be operated for the benefit of the public in contradistinction to being operated for the benefit of a private individual, corporation or group of individuals. So construed, operated for the benefit of the public means operated without an intent to make a private profit. It is not thereby meant that the institution must dispense charity or that it may not charge a fee for services rendered. Operated for the benefit of the public does mean that the receipts shall not be substantially more than the disbursements, so that a profit results. The provision does not mean that a hospital is exempt for a particular year merely because there is no profit for that year. The controlling feature is whether the institution was built, organized and/or is maintained with an intent to make a private profit, not whether there happens to be a profit in any given year. Applying this definition to the case at bar, the court said that the defendant's hospital was not a public hospital. We will assume, said the court, that it was open to the public indiscriminately in 1931, but it was not operated for the benefit of the public during that year. The judgment of the trial court was affirmed.—*State v. Browning (Minn.), 255 N. W. 254.*

Malpractice: Septic Arthritis Attributed to Negligent Treatment for Scarlet Fever.—Two suits were instituted against the defendant-physician, one by the patient, a child, and the other by the patient's father, wherein it was contended that by reason of the defendant's negligent treatment for scarlet fever the patient developed septic arthritis and became permanently crippled. In each case a verdict was rendered for the plaintiff and the defendant appealed to the Supreme Judicial Court of Massachusetts.

The defendant contended, principally, that even admitting the truth of the plaintiff's evidence tending to establish negligence, there was no evidence showing the causal connection between the negligence and the patient's injury. The testimony taken as a whole, said the Supreme Court, was sufficient to warrant the jury in finding that the defendant knowingly was guilty of omissions in the care of the patient which would bring unnecessary suffering to him and would contribute to, if they were not responsible for, the patient's permanently crippled condition. The defendant concluded that he was negligent in administering the "antitoxin." He failed to instruct the mother, or other attendant of the child, to keep him on a milk diet and to give him plenty of water. He discouraged the removal of the child to a hospital and failed to call in a specialist or a consultant. He opened without the proper aseptic precautions abscesses that developed and in other ways did not do what good practice demanded. Although the jury might have found that no single act of the defendant proximately caused injury to the patient, the testimony warranted the jury in finding that the omissions of the defendant constituted improper practice from a medical standpoint and that they, in combination, caused to some degree injury to the patient. It was not essential to the defendant's liability, continued the court, that he should be able to foresee the precise manner in which the injury happened; it was sufficient that injury to another was reasonably to be apprehended as the result of the negligent conduct.

The Supreme Court, therefore, upheld the verdict in favor of each plaintiff, subject, however, to final action by the trial court on the defendant's pending motion in each case for a new trial on the ground of excessive damage.—*Marangian v. Apelian (Mass.), 190 N. E. 729.*

Insurance, Life: Chiropractor Not a "Physician."—The plaintiff insurance company sought to avoid payment on a life insurance policy issued to the defendant's deceased husband, contending that the insured was treated by a "physician" within the meaning of a clause in the application for the policy which provided, in effect, that the policy should not take effect if the insured was treated by a "physician" between the date of his medical examination and the delivery of the policy. During that period, the insured was treated by a chiropractor. From an adverse decision in the trial court, the insurance company appealed to the Supreme Court of Michigan.

The application blank, said the Supreme Court, like the insurance policy, was prepared by the insurance company and hence it should be read in terms most favorable to the insured. So read, the word "physician" must be held to mean a legally licensed physician or doctor of medicine. Such is the meaning that a reading of the application would convey to the ordinary lay mind. It follows that, concluded the court, notwithstanding the insured consulted a chiropractor and was treated by him between the date of the medical examination and the delivery of the policy, the insurance became effective on the delivery of the policy. The decree entered by the trial court awarding the defendant the amount due on the insurance policy was consequently affirmed.—*New York Life Ins. Co. v. Modzelewski (Mich.), 255 N. W. 299.*

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association, New York, Feb. 21-23. Miss Mary A. Clarke, 50 West 50th Street, New York, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Detroit, April 10-13. Dr. E. K. M. Geiling, 710 N. Washington Street, Baltimore, Secretary.

American Society of Biological Chemistry, Detroit, April 10-13. Dr. H. A. Mattill, State University of Iowa, Iowa City, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 18-19. Dr. William D. Cutter, 535 North Dearborn Street, Chicago, Secretary.

Federation of American Societies for Experimental Biology, Detroit, April 10-13. Dr. H. A. Mattill, State University of Iowa, Iowa City, Secretary.

Pacific Coast Surgical Association, Santa Barbara, Calif., Feb. 21-23. Dr. Edgar L. Gilcreest, 384 Post Street, San Francisco, Secretary.

Southeastern Surgical Congress, Jacksonville, Fla., March 11-13. Dr. Benjamin T. Beasley, 478 Peachtree Street, N.E., Atlanta, Ga., Secretary.

Tennessee State Medical Association, Nashville, April 9-11. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases and Nutrition, Chicago

1: 609-676 (Nov.) 1934

Some Observations on Reciprocal Relationship Between Gastro-Intestinal and Female Pelvic Disturbances. J. Friedenwald and S. Morrison, Baltimore.—p. 609.

Discussion and Appraisal of Some Functional Disturbances of Digestive Tract. H. F. Kramer, Brooklyn.—p. 614.

Comparison of Methods for Quantitative Estimation of Diastase in Duodenal Fluid. C. R. Schmidt, H. Greengard and A. C. Ivy, Chicago.—p. 618.

Complete Treatment of Pernicious Anemia. R. L. Haden, Cleveland.—p. 628.

Treatment of Functional Vomiting. C. H. Drenckhahn and D. L. Wilbur, Rochester, Minn.—p. 635.

The Relation of Anemia to Surgical Diseases of the Gallbladder. R. A. Kordenat, Chicago.—p. 638.

1: 677-758 (Dec.) 1934

Gastro-Intestinal Studies: V. Gastric Juice in Anemias Other Than Pernicious Anemia. P. J. Fouts, O. M. Helmer and L. G. Zerfas, Indianapolis.—p. 677.

*Influence of Mucilaginous Substances on Emptying of the Stomach. H. Necheles, H. I. Sapoznik, R. Arens and J. Meyer, Chicago.—p. 684.

Studies on Gastric Hunger Mechanism. I. A. Manville and E. G. Chuinard, Portland, Ore.—p. 688.

Carcinoma of the Colon. C. W. Heald, Battle Creek, Mich.—p. 693.

Diagnosis and Prognosis in Gastric Ulcer: Clinical Study of Five Hundred Consecutive, Operatively Demonstrated Cases: Notes. F. Smithies, Chicago.—p. 697.

Unusual Right Diaphragmatic Hernia. W. C. Boeck and W. C. Cook, Los Angeles.—p. 705.

Diverticula of Jejunum: Review of Literature and Report of Two New Instances. J. S. Levy and A. De Groat, Little Rock, Ark.—p. 708.

Okrin as an Adjuvant in Treatment of Peptic Ulcer: Observations on Twenty-Two Patients. A. J. Atkinson, Chicago.—p. 713.

Chemical Phase of Gastric Secretions and Its Regulation. B. P. Babkin, Montreal.—p. 715.

Accessible Closed Loops of Small Intestine and Colon. G. E. Burget, Portland, Ore.—p. 722.

*Bactericidal Power of Stomach and Some Factors Which Influence It. A. Hanszen, Chicago.—p. 725.

Convenient Method of Establishing Diet and Insulin Therapy in Diabetes. Sister Mary Edwina, Racine, Wis.—p. 728.

*Studies in Food Allergy: Preliminary Report. A. W. Oelgoetz, P. A. Oelgoetz and Juanita Wittekind, Columbus, Ohio.—p. 730.

Roentgenographic Differentiation Between Diverticulitis and Cancer of Sigmoid. W. H. Stewart and H. E. Illick, New York.—p. 738.

Influence of Mucilaginous Substances on Emptying of Stomach.—Necheles and his associates tested the effect of hog's mucin, okra, olive oil and agar on the motility of and the digestion in the stomach. Tests were performed on six normal subjects, six patients affected with peptic ulcer and a dog carrying both gastric and duodenal cannulas. While all the test substances decreased the emptying time of the stomach, okra had the greatest effect. At the beginning of digestion, hog's mucin increases and okra decreases gastric motility. After three hours this is reversed and okra diminishes the emptying time by 26 per cent. In the stomach okra does not impair the digestion of meat; it considerably decreases the amount of gastric secretion. The therapeutic significance of these results is discussed.

Bactericidal Power of Stomach.—Hanszen shows that the bactericidal power of the stomach can be influenced by a number of factors. This property is enhanced by the taking of a meal one hour before the drinking of infected fluids. Meals with a high buffering value help to hold, and slowly give off, acid which serves to kill bacteria ingested one or more hours after the taking of a meal. In order that the bacteria may be killed, it is important that the gastric contents develop an acidity as high as or greater than p_H 2. After drinking contaminated liquids, the taking, within a short interval of time, of another meal, perhaps well buffered and somewhat alkaline, will tend to wash living bacteria, left behind in the nasopharynx or esophagus by the infected meal, directly into the intestine. It has been found that banana pulp serves as a well buffered meal to hold hydrochloric acid in the stomach. The sterilization of the gastric contents can be influenced by the resistance which some foods show to acidification; that is, the so-called acid deficit. The author's experiments were carried out on seven normal persons and on many patients, most of the latter ambulant, who were affected with minor disturbances, such as hay fever. The bacterium used was Bacillus prodigiosus, which was mixed with water or milk with a known buffer value and hydrogen ion concentration. Most of the foods used to influence the sterilizing power of the stomach were fruits.

Studies in Food Allergy.—The Oelgoetzes and Wittekind conclude from their study on sensitization to food that: 1. Most of the protein ingested is not split to the stage of amino-acids in the gastro-intestinal tract. A large part of the protein is absorbed into the blood as acid or alkali metaprotein and other derived proteins. The gastro-intestinal tract is essentially a receiving and mixing mechanism. Digestion is started in the gastro-intestinal tract but is continued and completed in the blood stream. 2. Normally, sufficient pancreatic juice is secreted to combine with all the food eaten and to provide an excess, which passes free (uncombined) into the blood stream, where it acts as a buffer solution, combining with and digesting any food that has been absorbed unmixed with enzymes. 3. Blood serum normally contains free pancreatic enzymes in a definite and constant concentration. These enzymes can be demonstrated by a test that the authors describe. 4. The concentration of pancreatic enzymes in the blood serum of a person on a regular ration, compared with that after taking a "test meal" consisting of quantitatively a greatly increased total ration, appears to be a direct measure of that individual's pancreatic (digestive) function. 5. It is probable that "hypersensitiveness" to foods is caused by an excess of free food (free of enzymes) in the blood serum, and that this excess is caused by a low pancreatic threshold (hypofunction). 6. In the authors' opinion the state of "allergy" to foodstuffs can be determined by ascertaining the concentration of free amylase in the serum before and after a test meal. 7. The rational treatment of sensitization to foods lies in the reduction of the total food intake. If the patient can maintain normal weight and adequate buffer enzymes on the reduced ration, no other treatment is necessary. If he is unable to do so, it would seem that dry pancreatic enzymes must be administered to make up the shortage.

American J. Obstetrics and Gynecology, St. Louis

28: 783-942 (Dec.) 1934

Limitations and Dangers of Intra-Uterine Application of Radium in Treatment of Carcinoma of Body of Uterus. J. A. Sampson, Albany, N. Y.—p. 783.

Roentgenologic Study of Mechanism of Engagement of Fetal Head. W. E. Caldwell, H. C. Moloy and D. A. D'Esopo, New York.—p. 824.

*Present-Day Trend in Treatment of Fibroids of Uterus: Analysis of Statistics of the Michael Reese Hospital During Past Eleven Years. J. L. Baer, R. A. Reis and E. J. DeCosta, Chicago.—p. 842.

*Blood Chemistry in Preeclampsia and Eclampsia. H. J. Stander and J. F. Cadden, New York.—p. 856.

Management of Cases of Persistent Active Phase of Adnexoperitonitis. W. R. Cooke, Galveston, Tex.—p. 872.

Injury of Ureter in Pelvic Surgery. P. T. Brown, Phoenix, Ariz.—p. 879.

Analysis of Errors Inherent in Pregnancy Tests Based on the Aschheim-Zondek Reaction. Leity Davy and E. L. Sevringhaus, Madison, Wis.—p. 888.

Successful Treatment of Case of Polyneuritis of Pregnancy. P. J. Fouts, G. W. Gustafson and L. G. Zerfas, Indianapolis.—p. 902.

Improved Irrigating Unit. L. H. Biskind, Cleveland.—p. 907.

Extract of Thymus in Pregnancy. M. G. DerBrucke, Brooklyn.—p. 912.

*Prevention of Impetigo Neonatorum by Use of Bacteriophage: Preliminary Report. P. W. Winder, Ann Arbor, Mich.—p. 914.

Treatment of Fibroids of Uterus.—Baer and his associates analyzed the case records of 1,001 patients treated for fibroids of the uterus during the last eleven years. No evidence was found to justify the conclusion that fibroids result from ovarian pathologic changes. Absolute sterility in this series was apparently due to tubal changes and not to the presence of fibroids or ovarian disturbances. Of the 1,001 patients, 73.5 per cent had one or more children and 80.4 per cent either had offspring

or had aborted, leaving an absolute sterility of only 19.6 per cent. Malignant conditions of the pelvis were found in 0.9 per cent, there being five sarcomas in fibroids and four carcinomas of the body of the uterus. The frequency of total hysterectomy shows an increase from 1.4 per cent in 1923 to 14.6 per cent in 1933. Vaginal hysterectomy shows a steady increase from 5.5 per cent to 18.1 per cent. Supravaginal hysterectomy remains the most frequently used treatment for fibroids: 56.2 per cent in 1923 as compared with 57.6 per cent in 1933. Myomectomy has its own group of indications. In the younger age group in which there are one or more children, it is being supplanted by supravaginal hysterectomy: 21.9 per cent in 1923, 7.6 per cent in 1933. The selection of radium as the treatment for fibroids has steadily diminished because of the increasingly long list of direct contraindications, the undesirability of a precipitate menopause, the inability to examine the pelvic and abdominal viscera and an appreciable proportion of failures: 11.1 per cent. Radium was used in 15 per cent of cases in 1923 and in 2.1 per cent in 1933. Partial or complete removal of the adnexa was performed in 47.1 per cent of the patients. Indications for these operations on the adnexa included not only pathologic changes but mechanical reasons and prophylaxis. The total mortality was 0.7 per cent (seven deaths). In the last group of 484 consecutive patients there was one death (0.21 per cent).

Blood Chemistry in Preeclampsia and Eclampsia.—Stander and Cadden regard preeclampsia and eclampsia as the same disease. Their frequently repeated blood chemical studies in 108 eclamptic and forty preeclamptic patients showed that the blood chemistry is an indispensable index of the severity of the disease and of specific treatment needed. The nonprotein nitrogen content of the blood in eclampsia and preeclampsia remains within normal limits, except in certain instances, late in the disease, when a rise indicates involvement of the kidneys as a result of the eclamptic disease. The blood urea nitrogen remains low, as in normal pregnancy, with the result that the ratio between urea nitrogen and nonprotein nitrogen is about 0.4, as compared with 0.5 in normal nonpregnant persons. The blood uric acid is increased in eclampsia and preeclampsia, indicating, the authors believe, a disturbance in its destruction in the liver. The uric acid content in the blood may be regarded as a fairly safe criterion of the severity of the disease. The blood sugar in eclampsia and preeclampsia is not greatly disturbed. Occasionally a definite hyperglycemia follows an eclamptic convulsion, owing perhaps to muscular activity. The alkali reserve is often decreased greatly, sometimes even to the level of true acidosis. The carbon dioxide combining power is the best and most readily available index of the necessity of antiacidosis treatment. The blood chlorides are not decreased markedly, except in an occasional patient with marked edema. Blood thioneine values in eclamptic patients are within normal limits. Glutathione is similarly within normal limits, except in patients with low blood hemoglobin readings. The increase in blood uric acid in eclampsia and preeclampsia cannot be accounted for by an increase in thioneine. The hyperglycemia sometimes observed in the convulsive stage of eclampsia appears to be a true hyperglycemia and not due to glutathione or thioneine.

Prevention of Impetigo Neonatorum by Use of Bacteriophage.—Winder applied a stock solution of staphylococcus bacteriophage to the skin of the new-born in an effort to prevent impetigo neonatorum. Immediately following delivery and after the usual oil bath the entire surface of the infant's body (including the scalp) is washed with the bacteriophage. The aim is to assure a surface film of bacteriophage covering the entire body. This so-called bacteriophage rub is repeated on the fifth day, following the regular soap and water bath. The bacteriophage solution, being nontoxic and sterile, may be applied more often and probably should be repeated when an epidemic is in progress. Of fifty-six female infants receiving the treatment, no instance of impetigo contagiosa neonatorum has occurred. Of sixty-one male infants not receiving treatment there were twenty-one cases of impetigo contagiosa neonatorum. The use of staphylococcus bacteriophage as a surface wash for new-born infants appears to be a preventive of impetigo neonatorum.

American Journal of Psychiatry, New York

91: 485-724 (Nov.) 1934

Alzheimer's Disease: Clinicopathologic Study of Five Cases. D. Rothschild, Foxborough, Mass.—p. 485.
Anamnesis of the Toxic Goiter Patient. Agnes Conrad, New York.—p. 521.
Neuroses Associated with Gastro-Intestinal Tract. G. E. Daniels, New York.—p. 529.
Physical Mental Relationships in Illness: Trends in Modern Medicine and Research as Related to Psychiatry. H. F. Dunbar, New York.—p. 541.
Dynamic Aspects of Cardiovascular Symptomatology. T. P. Wolfe, New York.—p. 563.
The Briggs Law of Massachusetts: Review and Appraisal. W. Overholser, Boston.—p. 585.
The Miller Delusion: Comparative Study in Mass Psychology. S. Stone, Concord, N. H.—p. 593.
Emotional States of General Paresis. P. G. Schube, Boston.—p. 625.
Crimes of Unintelligible Motivation as Representing an Initial Symptom of Insidiously Developing Schizophrenia: Study of Comparative Effects of Penitentiary Versus Hospital Regimen on Such Cases. A. W. Hackfield, Seattle.—p. 639.
Suicides and Homicides in Their Relation to Weather Changes. C. A. Mills, Cincinnati.—p. 669.
The Pyknolepsies. S. E. Jelliffe, New York, and J. Notkin, Poughkeepsie, N. Y.—p. 679.
Criteria for Estimating Value of Psychiatric Service in the Field of Criminology. B. Glueck, New York.—p. 693.

Archives of Internal Medicine, Chicago

54: 831-1022 (Dec.) 1934

Spider Poisoning: Experimental Study of Effects of Bite of Female Latrodectus Mactans in Man. A. W. Blair, University, Ala.—p. 831.
Life History of Latrodectus Mactans. A. W. Blair, University, Ala.—p. 844.
Pernicious Anemia: Results of Treatment of Neurologic Complications. R. R. Grinker and Ernestine Kandel, Chicago.—p. 851.
*Characteristics of Synovial Fluid in Various Types of Arthritis: Study of Ninety Cases. C. S. Keefer, W. K. Myers and W. F. Holmes Jr., Boston.—p. 872.
Calorigenic Action of Single Large Doses of Desiccated Hog Thyroid: Comparison with Action of Thyroxine Given Orally and Intravenously. W. O. Thompson, Phebe K. Thompson, S. G. Taylor III and Lois F. N. Dickie, Chicago.—p. 888.
*Myasthenia Gravis Associated with Thymoma: Report of Two Cases with Autopsy. J. Brem and H. F. Wechsler, New York.—p. 901.
Neurogenic Erosions and Perforations of Stomach and Esophagus in Cerebral Lesions: Report of Six Cases. Mabel G. Masten and R. C. Bunts, Madison, Wis.—p. 916.
*Adams-Stokes Syndrome with Transient Complete Heart Block of Vagovagal Reflex Origin: Mechanism and Treatment. Soma Weiss and E. B. Ferris Jr., Boston.—p. 931.
The Heart and Great Vessels in Combined Syphilitic and Rheumatic Infection. J. R. Lisa and Gertrude Jackson Chandlee, New York.—p. 952.
Some Factors Determining Variability of Skin Temperature. H. Freeman and F. E. Linder, Worcester, Mass.—p. 981.
Test of Blood Flow to an Extremity: Its Clinical Applications. H. C. Lueth and D. C. Sutton, Chicago.—p. 988.
Circulatory Dynamics in Myocardial Infarction. A. M. Fishberg, W. M. Hitzig and F. H. King, New York.—p. 997.

Characteristics of Synovial Fluid in Arthritis.—Keefer and his co-workers examined 120 samples of synovial fluid from ninety patients with various types of arthritis to determine the diagnostic significance of the various biologic and chemical characteristics of the fluid. 1. The bacteriologic examination of the fluids yielded information of the greatest value in the etiologic diagnosis of arthritis. Inoculation of guinea-pigs with the synovial fluid was helpful in the diagnosis of tuberculous arthritis. 2. The results of the gonococcic complement fixation and Wassermann tests of the blood and synovial fluids were in agreement. Both tests were of distinct aid in the etiologic diagnosis of disease of the joints. 3. The total cell count of the synovial fluid was increased in all the types of arthritis studied. It was highest in the infected fluids and lowest in the cases of Charcot joints and traumatic arthritis. Most noninfected fluids contained less than 40,000 cells per cubic millimeter. 4. When the synovial fluid was infected with micro-organisms, the polymorphonuclear cells were greatly increased, from 86 to 100 per cent, and the lymphocytes, monocytes and clasmatocytes were few in number. In tuberculosis of the joints, the polymorphonuclear count varied from 46 to 93 per cent, and the lymphocytes and monocytes were increased. 5. The percentages of lymphocytes, clasmatocytes and monocytes were always higher in the noninfected than in the infected fluids. The presence of a low cell count with an increase in the monocytes, lymphocytes and clasmatocytes was an indication of a noninfected fluid. 6. The chemical examination of the fluids yielded no information of diagnostic value in discriminating

between infected and noninfected fluids. The nonprotein nitrogen of both the infected and the noninfected synovial fluids was the same as that of the blood. The sugar content varied with the presence of organisms, the number of cells and the level of the sugar in the blood. A low sugar content did not always mean an infected fluid. The total protein value of the synovial fluid was increased in both groups and indicated only an inflammatory reaction. 7. Aside from the bacteriologic, cytologic and serologic examinations of the synovial fluid, other tests yielded little information of diagnostic value.

Myasthenia Gravis Associated with Thymoma.—Because of the degenerative changes found in the suprarenal cortices in their two cases and in others cited in the literature and because of the reciprocal relationship that apparently exists between the suprarenal cortex and the thymus, Brem and Wechsler submit a new theory to explain the occurrence of thymomas in this disease: that the pathologic changes in the thymus are secondary to a degenerative lesion of the suprarenal. They believe this is supported by the following observations: The relationship between lesions of the suprarenal cortices and asthenia, such as occurs in Addison's disease and in chronic suprarenal insufficiency, needs no elaboration, but that many such cases exhibit a hyperplasia of the thymus at necropsy is not well known. Following suprarenalectomy in the rabbit and rat, and less frequently in the dog and cat, there occurs a rapid and remarkable regeneration of the thymus, even in old animals. In infants, beginning about the second week of extra-uterine life, there occurs a spontaneous involution of the suprarenal cortex, coincident with a rapid increase in the size of the thymus. Finally, Marine assembled much evidence in support of the contention that status lymphaticus in man is dependent, in part at least, on a deficiency of some internal secretion common to both the suprarenal cortex and the gonads. The cortical extract that has been found to be efficacious in Addison's disease may not be the only hormone secreted, and, in analogy to the pituitary syndromes, a derangement of another hormone of the suprarenal may be the causative factor in myasthenia gravis. The significance of thymic hyperplasia and thymomas in myasthenia gravis is still shrouded in mystery, but that some relationship does exist is shown not only by the frequency of their occurrence but by the good results reported in this disease following extirpation and irradiation of the thymus. The cardiac musculature in the authors' two cases exhibited the typical lymphorrhages which have usually been described as being present only in the skeletal muscles. Atrophy of the skeletal muscles was noted in one of the cases.

Adams-Stokes Syndrome with Transient Complete Heart Block.—Weiss and Ferris report a case in which for ten years there were attacks of fainting precipitated usually by the swallowing of food. The patient had a traction diverticulum of the esophagus, distention of which with the aid of a rubber balloon promptly induced auriculoventricular dissociation of the heart and syncope. The release of pressure in the balloon was associated with a prompt return of normal sinus rhythm and the disappearance of symptoms. Barium chloride failed not only to influence the severity and the frequency of syncope but also to prevent the development of heart block. Epinephrine and ephedrine in small doses, which induced no change in the arterial pressure and only slight elevation in the heart rate, abolished all the symptoms, although pressure on the diverticulum continued to induce complete heart block. Following the administration of epinephrine and ephedrine, the onset of idioventricular rhythm, in contrast to the control observations, was associated with remarkably regular rhythm as a result of increased excitability of the ventricles. Atropine in doses that produced only slight depression of the vagal motor endings abolished the symptoms as well as the heart block. Paralysis of either of the vagus sheaths in the neck with procaine hydrochloride also abolished the fainting and the block. The Adams-Stokes attack in this case was induced by heart block precipitated by a vagovagal reflex. The source of the reflex was irritation of the sensory endings of the vagi by the diverticulum. The intracardiac mechanism active at the onset and the disappearance of heart block of reflex origin are described. The cardiac output and other aspects of the hemodynamics in a case of complete heart block were studied with the acetylene and optical methods. Ephedrine failed to induce a significant change in the blood flow. The relative part played by organic cardiac lesions and of neurogenic factors in the precipitation of Adams-Stokes attacks with heart block is discussed, and the simultaneous presence of multiple etiologic factors is stressed. Abnormal hyperactivity of the vagovagal reflex can be associated with a normal state of other reflexes of the same type. In the precipitation of Adams-Stokes attacks, cerebral ischemia due to decreased cardiac output is only one factor; other factors, particularly vasomotor reflexes, are emphasized.

Archives of Pathology, Chicago

18: 777-936 (Dec.) 1934

Plastic Studies in Abnormal Renal Architecture: II. Morphology of Abnormal Nephron in Terminal Hemorrhagic Bright's Disease. Jean Oliver and Ann Seaward Luey, Brooklyn.—p. 777.

Ligation of Common Bile Duct in the Rat: Anatomic and Behavioristic Effects. C. P. Richter and J. A. Benjamin Jr., Baltimore.—p. 817.

*Studies in Atherosclerosis: Chemical, Experimental and Morphologic: V. Possible Dangers of Iodine Therapy in Atherosclerosis of Aorta Seen from Experimental Standpoint. S. R. Rosenthal, Chicago.—p. 827.

*Argentaffinomas of Gastro-Intestinal Tract, Benign and Malignant. O. T. Bailey, Boston.—p. 843.

*Allergic Inflammation of Lungs: Pathogenesis of Lobar Pneumonia. B. M. Fried, New York.—p. 865.

Effect of Parathyroid Extract on Bones of Hypophysectomized Rat: Histologic Study. H. Selye, H. Mortimer, D. L. Thomson and J. B. Collip, Montreal.—p. 878.

Dinitrophenol: Studies of Blood, Urine and Tissues of Dogs on Continued Medication and After Acute Fatal Poisoning. M. L. Tainter, W. C. Cutting, D. A. Wood and F. Proescher, San Francisco.—p. 881.

Iodine in Treatment of Atherosclerosis.—Rosenthal states that large physiologic doses of iodine in the form of inorganic potassium iodide or organic iodine bound intramolecularly with protein produced a marked increase of the cholesterol in the blood and liver and a corresponding decrease of the cholesterol in the bile in rabbits fed cholesterol. The hypercholesteremia thus produced was far beyond that of rabbits which had had cholesterol alone added to their diet. When iodine was added later in the course of cholesterol feeding, the cholesterol esters of the blood increased for six weeks. The author suggests that in the rabbits in which the cholesterol metabolism was so markedly disturbed the action of the iodine on a slightly active gland caused a regression of the gland and in doing so liberated an increased amount of the thyroid hormone. The latter stimulated the general metabolism as well as the liver. As the liver excretes only free cholesterol through the bile, there was a corresponding proportional increase of the cholesterol esters of the blood. The aortas of the latter animals presented the most marked lipoid deposit, stressing the importance of the cholesterol esters in experimental atherosclerosis. A comparison of the thyroids of the animals fed iodine with those of the animals not fed iodine revealed a resting state of the colloid in the former and a slightly active state in the latter. As the action of iodine in the prevention of deposits of lipoid in the aorta of the rabbit fed cholesterol is dependent on increased thyroid activity, its employment in man should be guarded.

Argentaffinomas of Gastro-Intestinal Tract.—Bailey describes a series of thirty-one argentaffinomas of the gastrointestinal tract and presents three cases in detail as representative of the various types of these tumors. The stroma of the argentaffinoma consists of collagen fibers, reticulum, nerve fibers, smooth muscle cells and elastica. A study of the elastic tissue shows it to be abundant in both the benign and the malignant type of argentaffinoma. The metastatic tumor has a stroma composed of collagen, reticulum and elastic fibers. The elastica is derived in part from the adventitia of the small and medium-sized blood vessels in the tumor. The argentaffinoma has the property of stimulating the production of elastic tissue, a characteristic rare among tumors. Intestinal obstruction results from the growth of the tumor in the serosal layer with consequent buckling and distortion of the tunica muscularis. Complete annular tumor growth did not occur. The author presents material to show that the argentaffinoma cannot be regarded as a paraganglioma of the sympathetic nervous system. Clinically, the argentaffinoma in any location except the appendix is characterized by its extremely asymptomatic course—throughout life if the tumor is benign; if malignant, until late in the natural history of the tumor. With location

in the appendix, the symptoms of acute or chronic appendicitis are simulated frequently. This is true whether the tumor is benign or malignant. The extremely slow growth of the tumor of the malignant type encourages radical resection even in the presence of metastases. The tendency of the tumor to grow in cords in the mesentery renders it advisable to resect a segment of mesentery even in the absence of gross invasion. Because of the asymptomatic course of the malignant tumors until late, few have been subjected to early operation. Of those that were, very few have recurred.

Allergic Inflammation of Lungs. — Fried observed that, when an antigen is repeatedly injected subcutaneously into an animal, its absorbing capacity diminishes with each subsequent injection. Moreover, in these cases the last injection (usually the fifth or sixth) produces an acute exudative inflammation locally, looked on as an anaphylactic phenomenon; it is assumed that it occurs as a result of a combination of antigen and antibodies. In the experiments reported, rabbits were sensitized by repeated intraperitoneal injections of horse serum, the last injection (defined as "shocking") being introduced into the lungs by way of the trachea. A study of the lungs of these animals showed that: 1. The intratracheal ("shocking") injection of the heterologous serum soon produced an acute exudative, rapidly spreading inflammation in the lungs. 2. In a high proportion of the animals studied the lesion at its height was confined to one lung, having a diffuse lobar distribution. 3. The gross and microscopic aspects of the pulmonary lesion resembled in many ways acute lobar (fibrinous or genuine) pneumonia as seen in man. The nature of the latter disease was analyzed, and the hypothesis arrived at was (in accord with the views of earlier observations) that in this malady the character of the lesion in the lung probably depends on a state of local pulmonary hypersensitiveness (allergy, hyperergy). The author states that the similarities between the lesions in the lungs in genuine pneumonia in man and those that he observed in the experiments with horse serum (which he regards as "model" infections) favor the foregoing hypothesis.

California and Western Medicine, San Francisco

41: 361-432 (Dec.) 1934

The Common Cold. K. F. Meyer, San Francisco.—p. 361.
Rocky Mountain Spotted Fever and Endemic Typhus Fever: Observed in California. E. L. Munson, San Francisco.—p. 365.
Anesthesia in Surgery of the Chest. Dorothy A. Wood, San Francisco. —p. 373.
Posture in Early Childhood. C. L. Lowman, Los Angeles.—p. 382.
Birthmarks: Observations on Treatment. C. R. Caskey, Los Angeles. —p. 385.
Ketosis: Relation of Pituitary to Sex Differences Therein. H. J. Deuel Jr., Los Angeles.—p. 388.
Treatment of Low Grade Epidermoid Carcinoma by Means of Radium Needles. O. N. Meland, Los Angeles.—p. 390.
Physical Therapy: Criticisms and Suggestions. H. M. F. Behneman, San Francisco.—p. 393.
Positive Therapeutics: Pendulum Swings to It. L. H. O. Stobbe, Salt Lake City.—p. 396.
Compulsory Health Insurance: Part IX. F. L. Hoffman, Philadelphia. —p. 398.

Georgia Medical Association Journal, Atlanta

23: 449-490 (Dec.) 1934

Bilateral Renal and Ureteral Calculi. S. A. Kirkland, Atlanta.—p. 449.
Chest Conditions in Infants and Children. W. W. Anderson and D. F. Cathcart, Atlanta.—p. 456.

Indiana State Medical Assn. Journal, Indianapolis

28: 1-56 (Jan. 1) 1935

*Mechanical Factors in Renal Infections. D. W. Mackenzie, Montreal. —p. 1.
Silicosis. F. G. Banting, Toronto.—p. 9.
Modern Views About Nasal Infection. R. A. Fenton, Portland, Ore. —p. 12.
Signs and Phases of Cyclopropane Anesthesia. F. T. Romberger, Lafayette.—p. 18.
Vaginal Hysterectomy: Its History, Indications and Complications. R. C. Ottinger, Indianapolis.—p. 20.
Recent Advances in Treatment of Pulmonary Tuberculosis. R. S. Henry, Indianapolis.—p. 25.
Decentralization in Medicine. B. S. Cornell, Fort Wayne.—p. 29.

Mechanical Factors in Renal Infections. — Mackenzie stresses the fact that any condition of the kidney or ureter which causes urinary stasis must be regarded as a factor in the etiology of infection of the renal pelvis. The obstructing cause may be within the urinary tract or outside of it. The most common cause of obstruction within the urinary tract is stone. The most likely sites for lodgment of urinary calculi are at the ureteropelvic junction, at the brim of the bony pelvis and at the intramural portion of the ureter as it goes through the wall of the bladder. The obstructing cause may also depend on abnormality of development. Such abnormality may take place anywhere along the urinary canal, but it occurs more particularly in the upper portion where embryologic defects between the pelvis and the kidneys are so often found. Growths and inflammations in the neighboring organs may involve the urinary tract and thereby cause urinary stasis. Since the extensive use of radium in the treatment of malignant disease of the uterus and other pelvic organs, urinary stasis and infection sometimes have occurred from involvement of the lower ureteral segment in the ensuing cicatrization of the surrounding structures. Ureteral and renal pelvic dilatation and stasis have been demonstrated in normal pregnant women. Such dilatation, the author believes, is physiologic but nevertheless is a definite invitation to renal infection. Not infrequently it has been found that renal stasis has been caused by an involvement of the ureter anywhere along its course in dense, calcified lymph nodes. By far the most common cause of obstruction in the upper ureter and pelvis is the sagging or ptosed kidney. The author stresses the importance of mechanical agencies in the etiology of renal infections; in nearly 13,000 admissions 36 per cent, or 4,688 cases, were diagnosed as definite renal conditions. Of all these kidney conditions 63 per cent were of the obstructive type—pyelitis, hydronephrosis, pyonephrosis, nephroptosis and nephroptosis with hydronephrosis—conditions the etiology of which lies in the mechanical obstructions or defects. A careful analysis of obstructive renal conditions confirms his early impression that the etiologic factors concerned in the production of such conditions have their incipience in early life. One twelfth of all the admissions were infants, children and adolescents up to 20 years of age.

Journal of Bacteriology, Baltimore

28: 541-650 (Dec.) 1934

Oxidation Reduction Potentials and Ferricyanide Reducing Activities in Peptone Cultures and Suspensions of Escherichia Coli. C. E. Clifton, J. P. Cleary and P. J. Beard, Palo Alto, Calif.—p. 541.
Oxidation Reduction Potentials and Ferricyanide Reducing Activities in Glucose-Peptone Cultures and Suspensions of Escherichia Coli. C. E. Clifton and J. P. Cleary, Palo Alto, Calif.—p. 561.
Studies on Certain Physiologic Characters of Phytomonas Tumefaciens, Phytomonas Rhizogenes and Bacillus Radiobacter: Part I. H. E. Sagen, A. J. Riker and I. L. Baldwin, Madison, Wis.—p. 571.
Id.: Part II. A. A. Hendrickson, I. L. Baldwin and A. J. Riker, Madison, Wis.—p. 597.
Bacterial Variation, with Especial Reference to Behavior of Some Mutabile Strains of Colon Bacteria in Synthetic Mediums. I. M. Lewis, Galveston, Texas.—p. 619.

Journal of Biological Chemistry, Baltimore

107: 383-606 (Nov.) 1934

Further Studies on Availability of Iron in Biologic Materials. W. C. Sherman, C. A. Elvehjem and E. B. Hart, Madison, Wis.—p. 383.
Allocation of Free Amino Groups in Proteins and Peptides. S. Gurin and H. T. Clarke, New York.—p. 395.
Studies on Purine Metabolism: III. Fate of Guanosine and Adenosin in Dog. L. R. Cerecedo and F. W. Allen, Berkeley, Calif.—p. 421.
Studies on Metabolic Processes During Growth: I. Metabolism of Isobarbituric Acid in Growing Dog. L. R. Cerecedo, Berkeley, Calif., and J. A. Stekol, New York.—p. 425.
Sparing Action of Fat on Vitamin B: VI. Influence of Levels of Protein and Vitamin G. H. M. Evans, S. Lepkovsky and Elizabeth A. Murphy, Berkeley, Calif.—p. 429.
Id.: VII. Effectiveness of Various Natural Fats in Sparing Vitamin B. H. M. Evans, S. Lepkovsky and Elizabeth A. Murphy, Berkeley, Calif.—p. 439.
Sparing Action of Fat on Vitamin G. H. M. Evans, S. Lepkovsky and Elizabeth A. Murphy, Berkeley, Calif.—p. 443.
Feeding Experiments with Mixtures of Highly Purified Amino Acids: VI. Relation of Phenylalanine and Tyrosine to Growth. Madelyn Womack and W. C. Rose, Urbana, Ill.—p. 449.
Phospholipid Content and Activity in Muscle. W. R. Bloor and Ruth H. Snider, Rochester, N. Y.—p. 459.
Vitamin E: II. Stability of Concentrates Toward Oxidizing and Reducing Reagents. H. S. Olcott, Iowa City.—p. 471.
Oxidation of Metabolites: III. Mechanism of Oxidation of Fatty Acids in Alkaline Phosphate Hydrogen Peroxide System. E. J. Witzemann, Madison, Wis.—p. 475.
Arachidonic Acid in Butter Fat. A. W. Bosworth and E. W. Sisson, Columbus, Ohio.—p. 489.

Comparative Availability of *d*-Histidine and *l*-Histidine for Growth. G. J. Cox, Urbana, Ill., and C. P. Berg, Iowa City.—p. 497.

Reaction Between α-Ketonic Acids and α-Amino Acids. R. M. Herbst and L. L. Engel, New York.—p. 505.

Note on Preparation of Gonadotropic Extracts of Urine of Pregnancy by Tungstic Acid Precipitation. P. A. Katzman and E. A. Doisy, St. Louis.—p. 513.

Oxidation of Sulphur of Acetyl and Formyl Derivatives of *d*-Cystine and *l*-Cystine in Animal Body. V. du Vigneaud, H. S. Loring and H. A. Craft, Washington, D. C.—p. 519.

Bombicysterol: Note. W. Bergmann, New Haven, Conn.—p. 527.

Walden Inversion: XVIII. Analysis of Rotatory Dispersion Curves of α-Substituted Normal Carboxylic Acids. P. A. Levene and A. Rothen, New York.—p. 533.

Rotations of Nitrophenyl Esters of Disubstituted Acetic and Propionic Acids and of Corresponding Free Acids. P. A. Levene, A. Rothen and G. M. Meyer, New York.—p. 555.

Studies on Biologic Oxidations: III. Oxidation Reduction Potential of System Lactate-Enzyme-Pyruvate. E. S. G. Barron and A. B. Hastings, Chicago.—p. 567.

Id.: IV. Mechanism of Catalytic Effect of Reversible Dyes on Cellular Respiration. R. H. DeMeio, M. Kissin and E. S. G. Barron, Chicago.—p. 579.

Further Studies on Concentration and Chemical Nature of Vitamin G. Lela E. Booher, New York.—p. 591.

Investigations of Growth Promoting Properties of Vitamin G Concentrates. Lela E. Booher, H. M. Blodgett and J. W. Page, New York.—p. 599.

Journal of Experimental Medicine, New York

61: 1-148 (Jan. 1) 1935

Effect of Staphylococcus Aureus Toxin on Kidney. W. C. Von Glahn and Julia T. Weld, New York.—p. 1.

Cortin Protection Against Anaphylactic Shock in Guinea-Pigs. J. Wolfram and R. L. Zwemer, New York.—p. 9.

Preservation of Typhus Fever Rickettsiae in Cultures. Clara Nigg, New York.—p. 17.

Properties of Causative Agent of Chicken Tumor: X. Chemical Properties of Chicken Tumor Extracts. A. Claude, New York.—p. 27.

Id.: XI. Chemical Composition of Purified Chicken Tumor Extracts Containing Active Principle. A. Claude, New York.—p. 41.

*Demonstration of Tumor Growth-Inhibiting Factor from Normal Human Connective Tissue. J. J. Morton and D. N. Beers, Rochester, N. Y.—p. 59.

Pressor Substances from Body Fluids of Man in Health and Disease. I. H. Page, New York.—p. 67.

Observations on Depressor Extracts of Human Blood and on Vascular Action of Extracts of Rabbit and Dog Blood. I. H. Page, New York.—p. 97.

Experimental Studies on Encephalitis: I. Transmission of St. Louis and Kansas City Encephalitis to Mice. L. T. Webster and G. L. Fite, New York.—p. 103.

I. Bartonella Incidence in Splenectomized Bile Fistula Dogs. R. E. Knutti and W. B. Hawkins, Rochester, N. Y.—p. 115.

II. Hemoglobin and Bile Pigment Overproduction in Splenectomized Bile Fistula Dog. R. E. Knutti, W. B. Hawkins and G. H. Whipple, Rochester, N. Y.—p. 127.

Association of Bartonella Bodies with Induced Anemia in the Dog. C. P. Rhoads and D. K. Miller, New York.—p. 139.

Tumor Growth-Inhibiting Factor in Connective Tissue.—Morton and Beers point out that extracts from fresh normal human connective tissue (rectus sheath) exhibited a decided inhibiting action on grafts of rat tumor 256 transplanted into test animals. There was complete inhibition of tumor growth in 66 per cent of the animals and a marked retardation in the rate of growth in another 15 per cent, the tumors in these instances being much smaller than the controls transplanted at the same time. In only one experiment was there failure to obtain a lasting growth-inhibitory effect. The tumors in these animals (19 per cent), although showing an initial retardation in growth, apparently overcame the restraint and at the end of five weeks were larger than the control series. Extracts from fresh normal human muscle tissue, on the other hand, showed no such inhibiting action on grafts of rat tumor 256.

Journal of Industrial Hygiene, Baltimore

16: 327-376 (Nov.) 1934

Roentgen Classification of Pneumonoconiosis, Based on Roentgen Appearances, With and Without Coexisting Tuberculous Process, and the Differential Diagnosis. H. K. Pancoast and E. P. Pendergrass, Philadelphia.—p. 327.

Bronchiogenic Carcinoma Associated with Pneumonoconiosis: Report of Two Cases. M. L. Allen, Philadelphia.—p. 346.

Carcinoma of Larynx in Pneumonoconiosis: Report of Cases. J. H. Harris, Philadelphia.—p. 348.

Massive Lesions in Pneumonoconiosis Simulating Mediastinal Tumors. J. H. Harris, Philadelphia.—p. 351.

Alcohol Studies: II. Concentration of Alcohol in Blood. M. Schmidt, Copenhagen, Denmark.—p. 355.

Military Surgeon, Washington, D. C.

75: 359-408 (Dec.) 1934

Sterilization of Instruments in the Field. G. P. Lawrence.—p. 389.

Relation Between Immunity and Allergy. R. L. Kahn.—p. 390.

Recurrent Lymphangitis of Lower Third of Leg: Report of Three Cases. F. J. Vokoun, Cleveland.—p. 393.

Missouri State Medical Assn. Journal, St. Louis

31: 453-492 (Dec.) 1934

What the General Practitioner Should Know About Prevention of Eye Diseases. E. P. North and V. L. Jones, St. Louis.—p. 453.

Dermoid Cysts of the Mesentery. J. G. Montgomery and F. S. Morest, Kansas City.—p. 456.

Endocrine Diagnosis and Therapy in Gynecologic Conditions. C. M. MacBryde, St. Louis.—p. 458.

Treatment of the Underprivileged Diabetic. T. L. Howden, St. Joseph.—p. 462.

Demonstration and Interpretation of Shadows in Urograms. O. J. Wilhelmi, St. Louis.—p. 465.

Pelvic Malignancy with Ascites and Its Diagnosis: Report of Case. E. B. Robichaux and Y. D. Craven, Excelsior Springs.—p. 467.

Nebraska State Medical Journal, Lincoln

19: 441-472 (Dec.) 1934

Fixed Skeletal Traction in Treatment of Fractures by Use of the Kirschner Wire Technic in Plaster Casts. J. E. M. Thomson, Lincoln.—p. 441.

Acne Vulgaris and the General Practitioner. D. J. Wilson, Omaha.—p. 444.

Larynx and Its Relation to Bronchoscopy and Esophagoscopy. J. P. Rigg, Grand Island.—p. 448.

Methods of Infant Feeding as Used in the New-Born Clinic, University of Nebraska College of Medicine the Past Three Years. C. G. Weigand, Omaha.—p. 451.

Pseudoparalysis of Childhood. J. V. Reilly, Grand Island.—p. 453.

*Poisoning Due to Shoe Dye: Report of Cases. R. E. Harry, York.—p. 455.

Anthrax Septicemia, with Treatment by Massive Doses of Antianthrax Serum: Case. G. N. Nilsson, Bloomfield.—p. 457.

Massive Strangulation of Intestine Due to Nonadherent Meckel's Diverticulum. C. H. Waters, Omaha.—p. 458.

Tubercular Appendicitis. M. Emmert, Omaha.—p. 459.

20: 1-40 (Jan.) 1935

Surgical Considerations and Complications in Gallbladder Disease. R. R. Best, Omaha.—p. 1.

Appendicitis, Complicated by Thrombophlebitis of Mesenteric Veins with Abscesses: Case Report. R. J. Stearns, Omaha.—p. 6.

Significance of Nervousness in Childhood. G. W. Dishong, Omaha.—p. 7.

Appendicitis in Rural Community. C. E. Beede, David City.—p. 12.

Cancer of Female Pelvic Organs: Report of One Hundred and Thirty-Five Cases from the University of Nebraska College of Medicine. E. C. Sage, Omaha.—p. 16.

Bone and Joint Injuries About the Elbow. H. F. Johnson, Omaha.—p. 18.

Infantile Eczema. W. O. Colburn, Lincoln.—p. 21.

Diarrheas in Infants. A. G. Dow, Omaha.—p. 22.

Tuberculosis in Childhood. E. W. Hancock, Lincoln.—p. 25.

Floating Bodies in a Vein. M. Emmert, Omaha.—p. 27.

Poisoning Due to Shoe Dye.—Harry reports four cases of poisoning as a result of contact with shoe dye. He presents a review of the available literature on this subject and gives the general train of symptoms and signs that usually accompany these cases. Symptoms characteristic of the poisons from the solvents used in shoe dyes are headache, dizziness, restlessness, backache, paralysis, convulsions, ringing in the ears, vomiting, dyspnea, weakness, nausea and methemoglobinemia. A constant sign is the intense cyanosis or bluish black discoloration of the skin, mucous membranes and nails. The author's cases were of a mild nature but serve to illustrate the point that in all cases of intense cyanosis poisoning from shoe dyes should not be overlooked.

New England Journal of Medicine, Boston

211: 1077-1126 (Dec. 13) 1934

*Takata-Ara Test in Diagnosis of Liver Disease. C. W. Heath, with technical assistance of Elizabeth F. King, Boston.—p. 1077.

The Care of the Patient as the Religion of the Physician. S. Rushmore, Boston.—p. 1081.

Tumors of Breast. D. Lewis, Baltimore.—p. 1088.

Friedman's Modification of Aschheim-Zondek Test. J. N. Friborg, Manchester, N. H.—p. 1089.

Takata-Ara Test in Diagnosis of Liver Disease.—Heath points out that the Takata-Ara serum reaction is not well known in this country and appears to deserve some recognition, not only as a diagnostic aid but also as an advance in the knowledge of the physiology of the liver. During the past year he has performed the test on the serums of more than 400 cases of all types entering the general hospital wards, par-

ticularly patients who showed evidence of liver disorder. The method used for testing the serum and ascitic fluid has been greatly simplified along the lines indicated by Crane. The author has found the Takata-Ara serum reaction to be positive in 60 per cent of seventy-seven cases of liver cirrhosis and also in certain cases of marked liver damage. It was positive in practically all cases of advanced liver cirrhosis. The reaction was positive in less than 3 per cent of 376 general medical and surgical cases in which there was no definite evidence of liver damage. The reaction is simple to perform and to interpret. It may be regarded at present as a specific liver function test, although it does not run parallel with other liver function tests. In particular it bears no relationship to the degree of jaundice. It is useful in the diagnosis of obscure abdominal conditions in which there is a question of liver cirrhosis or severe damage to the liver. Performed on ascitic fluid, it is of value in determining the presence of cirrhosis.

New Jersey Medical Society Journal, Trenton

31: 613-670 (Nov.) 1934

Prenatal Care. A. W. Bingham, East Orange.—p. 619.
The Surgical Aspects of Pneumonia. R. H. Dieffenbach, Newark.—p. 622.
Examination of the Esophagus for Foreign Body: Report of Unusual Case. E. Reissman, Newark.—p. 626.
Late Occurrence of Stitch Abscess: Report of Case. C. Hyman, Atlantic City.—p. 628.
Clinical Application of Recent Contributions in Female Endocrinology. F. E. Keene and F. L. Payne, Philadelphia.—p. 629.
The Physician and Principles of Organized Medicine. E. W. Sprague, Newark.—p. 634.
Physicians and Other Health Agencies. T. B. Lee, Camden.—p. 640.
The Future of Medical Practice. W. B. Morris, Springfield.—p. 642.

31: 671-726 (Dec.) 1934

Erythroblastosis of the New-Born. R. R. White, East Orange.—p. 677.
Clinical Control of Chronic Hemorrhagic States in Childhood. I. N. Kugelmass, New York.—p. 683.
Subtotal Versus Total Hysterectomy. M. Danzis, Newark.—p. 695.
Uveal Infections. R. W. Baseman, Asbury Park.—p. 700.
Generalized Argyria. L. J. B. LeBel, Nutley.—p. 703.

New York State Journal of Medicine, New York

34: 993-1046 (Dec 1) 1934

Prepared Physicians. A. J. Bedell, Albany.—p. 993.
*Experimental Evaluation of Use of Some Vaginal Antiseptics During Labor: Preliminary Report. R. G. Douglas and Henrietta S. Rhees, New York.—p. 996.
The Pathology of Senile Cataract. D. B. Kirby, New York.—p. 1003.
The Present Status of the Female Sex Hormone from Clinical Standpoint. R. T. Frank, New York.—p. 1009.
Leukocytes in Skin Diseases. R. H. Rulison, New York.—p. 1013.
*Undulant Fever: Difficulties in Diagnosis and Treatment: Preliminary Report of Fifty-One Cases. H. J. Harris, Westport.—p. 1017.
Tissue Reactivity to Streptococci and Its Bearing on the Problem of Arthritis. C. H. Hitchcock, Syracuse.—p. 1022.

34: 1047-1104 (Dec. 15) 1934

Treatment of Chronic Intractable Heart Disease by Total Thyroidectomy. D. D. Berlin and H. L. Blumgart, Boston.—p. 1047.
Man as a Complete Organism—In Health and Disease. G. Draper, New York.—p. 1052.
Vagaries of Appendicitis. F. H. Flaherty, Syracuse.—p. 1064.
Organization of the Columbia County Department of Health. W. D. Collins, Hudson.—p. 1067.
Relation of Columbia County Department of Health to the Physician. F. C. Maxon, Chatham.—p. 1069.
Modification of the Detroit Plan in Administering Public Health. L. Van Hoesen, Hudson.—p. 1072.
High Power and Low Power Roentgenographic Differentiation Between Diverticulitis and Cancer of Sigmoid. W. H. Stewart and H. E. Illick, New York.—p. 1075.
Study of Six Hundred and Seventy-One Cases of Peptic Ulcer, with Especial Emphasis on One Hundred and Fourteen Postoperative Cases. R. E. Church and J. W. Hinton, New York.—p. 1079.
Schilling Hemogram: Its Value to the Surgeon. A. M. Dickinson, Albany.—p. 1085.

Use of Vaginal Antiseptics During Labor.—In a study of the value of vaginal antiseptics employed during labor, Douglas and Rhees observed that both a 5 per cent solution of mercurochrome and a 1:1,000 aqueous solution of merthiolate are fairly efficient vaginal antiseptics during the first stage of labor. They decreased the colony counts with marked regularity and in a few instances there was at least complete temporary sterilization of the vagina. Metaphen in oil in the concentration employed is not an efficient vaginal antiseptic during the first stage of labor, the result being approximately the same as in the group of patients who received no instillation. In general the colony counts on poured plates were much higher when incubated anaerobically than they were when incubated aerobically. In a considerable number of patients each had constant organisms in her series of inoculums in spite of instillations of the more efficient vaginal antiseptics. Carefully controlled experimental data, cultures being incubated under both aerobic and anaerobic conditions, are necessary to determine accurately the value of an antiseptic instilled in the vagina during the first stage of labor.

Undulant Fever.—Within a radius of 45 miles, fifty-one patients having Bacillus abortus infection have been observed by Harris within eighteen months. Obviously, other cases exist in patients not ill enough to cause them to consult a physician or in those whose symptoms have been wrongly diagnosed when seen. No two of the author's patients had symptoms nearly identical. Among the frequent complaints are chills, sweating, indigestion, flatulence, constipation, nausea, vomiting, nosebleed, joint and muscle lameness, pain in various parts of the abdomen and chest, sore throat, hoarseness, cough, dysuria, loss of weight, anorexia, skin eruptions, palpitation and dyspnea. Little may be found objectively and thus a neurosis may be suggested. Usually the physical signs do not fit in with the tentative diagnosis. The diagnosis was made usually by the blood agglutination test. However, blood agglutination is negative in many instances early in the disease and, in a few cases, even after months or years. Low agglutination titers (1:10, 1:20 or 1:40) are as significant in patients with a clinical picture of undulant fever as is agglutination in dilutions of from 1:80 to 1:2,500. Repeated agglutination tests may be essential. In doubtful cases the skin test is of great value. Skin tests should not be done in patients previously treated with B. abortus vaccine, as violent reactions and local skin necrosis may occur. Treatment with B. abortus vaccine has been the only method showing real promise in these cases. Early infections appear to yield readily to vaccine therapy. Chronic infections respond slowly. The acutely ill patient does not tolerate any but the smallest amount of vaccine without severe or even violent reaction and, if circumstances warrant delay, should have no vaccine until the remission begins. Long standing cases may require much larger doses than the average full dose of 1 cc. Moderate reactions are apparently desirable, especially in long standing cases in which there may be assumed to be foci of infection in tissues not easily influenced by stimulation of antibodies. Relapse often occurs during treatment or after it has been discontinued and is usually attended by a sharp rise in agglutination titer, which subsequently falls as improvement occurs again. Forty-five patients have been discharged as apparently cured after a minimum of six weeks and a maximum of ten months of treatment and have remained well for periods up to one year. The remaining cases were of long standing before treatment was begun, the history in some indicating from five to ten years of infection and in one probably nineteen years. These patients have all improved markedly under treatment.

Oklahoma State Medical Assn. Journal, McAlester

27: 425-466 (Dec.) 1934

Anorectal Fistulas. R. L. Murdoch, Oklahoma City.—p. 425.
What Should Be Our Attitude Toward the Child with Cerebral Birth Palsy? B. H. Nicholson, Oklahoma City.—p. 430.
Cinch Shortening Method for Extra-Ocular Muscles. H. O. Randel, Okmulgee.—p. 433.
Blue Sclera. L. C. Kuyrkendall, McAlester.—p. 434.
Treatment in Postoperative Ileus. G. H. Niemann, Ponca City.—p. 438.
Report of Persimmon Bezoars Occurring Around Tulsa, Oklahoma. H. D. Murdock, Tulsa.—p. 442.

Pennsylvania Medical Journal, Harrisburg

38: 157-232 (Dec.) 1934

Why Women Die in Childbirth: Some Reasons and Remedies. F. C. Holden, New York.—p. 157.
Psoriasis. P. A. Deckard, Harrisburg.—p. 160.
Treatment of Hemorrhoids: Comparison of Operative and Nonoperative Methods. M. S. Kleckner, Allentown.—p. 163.
Arthritis of the Spine. S. J. Hawley, Danville.—p. 168.
Dinitro Compounds and Weight Reduction. E. L. Bortz, A. Sindoni Jr. and Ethel May Hobson, Philadelphia.—p. 170.
Rupture of the Kidney. T. C. Stellwagon, Philadelphia.—p. 174.
Minor Conditions Affecting Ear, Nose and Throat. J. R. Simpson, Pittsburgh.—p. 178.
Significance of Intelligence Quotient. B. L. Keyes, Philadelphia.—p. 182.
Preventive Treatment of Goiter in Schools. J. M. Quigley, Clearfield.—p. 185.

Public Health Reports, Washington, D. C.

49: 1415-1452 (Nov. 30) 1934

Experimental Psittacosis in Pocket Gopher. V. M. Hoge.—p. 1415.
Pathology of Psittacosis in Pocket Gopher. R. D. Lillie and V. M. Hoge.—p. 1419.
The Constitutional Psychopath as the Warden's Problem. H. C. Hill. —p. 1423.

49: 1453-1494 (Dec. 7) 1934

Further Studies on Growth and Economic Depression: Comparison of Weight and Weight Increments of Elementary School Children in 1921-1927 and 1933-1934. C. E. Palmer.—p. 1453.

49: 1495-1526 (Dec. 14) 1934

*Distribution of Immunity Against Encephalitis Virus of the St. Louis Type in the United States as Determined by the Serum Protection Test in White Mice. J. G. Wooley and C. Armstrong.—p. 1495.
What Every Person Should Know About Milk. L. C. Frank.—p. 1505.

49: 1527-1556 (Dec. 21) 1934

Job Analysis of Rural Sanitation Officer: Brunswick-Greensville Health Administration Studies Number Two. J. O. Dean and J. W. Mountin. —p. 1529.
Psychiatric Aspects of Job Placement. J. G. Wilson.—p. 1543.

Distribution of Immunity Against Encephalitis Determined by Serum Protection Tests in White Mice.—Wooley and Armstrong carried out serum protection tests in mice on 524 human serums collected from forty-nine cities located in twenty-six states and the District of Columbia which gave definite protection in 158, or 30.1 per cent; questionable protection in 56, or 10.7 per cent, and no protection in 310, or 59.1 per cent. Serums giving definite protection were collected from thirty-two cities located in twenty-one states and the District of Columbia. Of serums from thirty-nine cases of clinically definite encephalitis from the St. Louis epidemic (1933), collected from four to ten months following the attack, thirty-seven, or 94.8 per cent, showed protection. Among 113 normal controls having no known exposure to encephalitis there were eleven, or 9.4 per cent, whose serums gave protection, while among fifty-six normal controls who had been in contact with cases there were twenty, or 35.7 per cent, whose serums showed definite protection. A positive serum protection test is believed to be evidence that the serum donor had been in contact with the virus of encephalitis and had suffered either a clinical or a subclinical type of infection. The authors believe that the serum protection tests that they report indicate that the St. Louis (1933) type of encephalitis is immunologically distinct from epidemic encephalitis, poliomyelitis and the postinfectious encephalitides.

Rhode Island Medical Journal, Providence

17: 179-194 (Nov.) 1934

Report of Delegate from the Rhode Island Medical Society to the American Medical Association. G. W. Wells, Providence.—p. 179.
Undulant Fever (Brucellosis Hominis). M. L. Grover, Providence.—p. 180.

17: 195-210 (Dec.) 1934

Methylene Blue in Cyanide and Carbon Monoxide Poisoning: Survey of Literature. H. B. Luke, Providence.—p. 195.
Pernicious Vomiting of Pregnancy. F. S. Hale, Providence.—p. 200.
Quinidine Sulphate Therapy. C. B. Leech, Providence.—p. 205.

Southern Surgeon, Atlanta, Ga.

3: 251-330 (Dec.) 1934

Surgery in Pulmonary Tuberculosis: Its Increasing Importance. P. H. Ringer, Asheville, N. C.—p. 251.
Abdominal Disease as Cause of Abdominal Symptoms. F. K. Boland, Atlanta, Ga.—p. 262.
Vaginal Hysterectomy: Its Indications, Advantages and Technic. S. O. Black, Spartanburg, S. C.—p. 271.
Tumors of the Breast. J. F. Erdmann, New York.—p. 277.
Intracapsular Extraction of Cataracts. S. C. Howell, Atlanta, Ga.—p. 290.
Value of Bronchoscopy in Diagnosis and Treatment of Lung Suppuration. W. F. Zinn, Baltimore.—p. 294.
Developments in Operative and Diagnostic Instrumental Urology. J. F. McCarthy, New York.—p. 303.
Appendicitis with Peritonitis: Treatment Without Drainage. A. M. Shipley, Baltimore.—p. 308.
*Observations on Peptic Ulcer: Experiments Indicating Etiologic Importance of Chemical and Mechanical Factors and Their Relationship to Pyloric Dysfunction. C. B. Morton, University, Va.—p. 316.

Observations on Peptic Ulcer.—Morton discusses experiments which seem to suggest that the pylorus plays an important part in controlling the chemical and mechanical factors which are commonly thought to be of importance in the etiology of peptic ulcer. The results of the experiments, in which a degree of alteration in the normal function of the pylorus has been produced by encircling the pyloric ring with a contractile band of jejunal muscle, seem to indicate that primary pyloric dysfunction may cause chronic inflammatory lesions of the duodenum, probably through a disturbance in the normal acid-alkali relationship and balance at the pylorus. In the dog the lesion is a duodenitis that is almost identical with duodenitis in man. Because of the definite relationship between duodenitis and duodenal ulcer clinically, the probable significance of the results as regards the etiology of peptic ulcer in man is suggestive.

Texas State Journal of Medicine, Fort Worth

30: 487-550 (Dec.) 1934

*Sporadic Hemophilia, with Especial Reference to Successful Therapy. W. L. Marr and G. Herrmann, Galveston.—p. 494.
Bronchoscopic Irrigation and Aspiration in Treatment of Lung Abscess. L. Daily, Houston.—p. 499.
Primary Intracranial Neoplasms: Report of Thirty Cases. W. N. Powell, Galveston.—p. 505.
Tarsectomy in Incomplete Ptosis. C. S. Alexander, Houston.—p. 511.
Hay Fever Pollens of West Texas Area. E. D. Sellers, Abilene.—p. 514.
Sodium Barbital and Sodium Phenobarbital Narcosis in Treatment of Acute Psychoses. G. F. Witt and T. H. Cheavens, Dallas.—p. 517.
The Fifth Nerve and Its Reflexes. A. H. Andrews, Chicago.—p. 521.
Transvaginal Sterilization. H. O. Smith, Marlin.—p. 525.
Public Health Measures in Control of Syphilis. C. F. Lehmann, San Antonio.—p. 529.

Sporadic Hemophilia and Its Therapy.—Marr and Herrmann cite two sporadic cases of hemophilia. They believe that a reliable and effective treatment, constantly available, consisting of the intramuscular injection of whole blood and blood taken from the patient himself, combines the effect of venesection with that of injected blood. They also believe from the results of the blood studies observed following the injection of whole blood that the decrease in the coagulation time can be explained on the basis of the increased platelet count, and it seems conceivable that these new platelets must be less resistant to disintegration and therefore more likely to promote a quicker coagulation of the blood. Between periods of bleeding to promote general health, to prevent infection and to maintain the clotting element at the highest possible level, a high protein, gelatin and high vitamin B diet is indicated. The use of protein sensitization is effective if followed continuously, but care must be exercised not to produce a generalized protein reaction. Good results may be obtained by the use of estrogenic substance in some cases. The causes of sporadic hemophilia are not known, but congenital syphilis is occasionally accompanied by this condition. Other causes may be operative, such as the absence of estrogenic substance. This possible etiologic factor remains to be established. In this manner the authors' second patient, conceived at the end of a long family and during the onset of the mother's menopause, seems worthy of comment.

West Virginia Medical Journal, Charleston

31: 1-48 (Jan.) 1935

Diabetes Mellitus and Its Complications. H. G. Thompson, Charleston. —p. 1.
Historical Review of Factors in Specific Therapy. T. W. Murrell, Richmond, Va.—p. 6.
Urinary Stasis: Its Influence on Chronic Infection of Urinary Tract. J. U. Rohr, Charleston.—p. 12.
Some Physiologic Considerations of Cardiovascular System. E. J. Van Liere, Morgantown.—p. 14.
Community Participation in General Disease Prevention. R. I. Frame, Sharples.—p. 17.
Digitalis: Its Uses and Dangers. D. C. Ashton, Beckley.—p. 19.
Abdominal Pain. J. W. Moore, Charleston.—p. 22.

Yale Journal of Biology and Medicine, New Haven

7: 83-190 (Dec.) 1934

Method for Remote Control of Electric Stimulation of Nervous System. E. L. Chaffee, Boston, and R. U. Light, New Haven, Conn.—p. 83.
Unusual Diaphragmatic Hernia Found in the Course of Dissection of White Male, Aged Sixty. J. Budnitz, M. Miller and H. B. Ferris, New Haven, Conn.—p. 129.
Tissue Reactions in Immunity: Some Clinical Implications. R. L. Kahn, Ann Arbor, Mich.—p. 133.
Anatomic Variations in Fifth Lumbar Vertebra as Factors in Low Back Pain. D. S. O'Connor, New Haven, Conn.—p. 147.
The Shadowed Side of Spallanzani. J. B. Hamilton, New Haven, Conn. —p. 151.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

46: 457-514 (Nov.) 1934

Cheiropompholyx. A. D. McLachlan and W. H. Brown.—p. 457.
Id. I. Muende.—p. 479.

British Journal of Ophthalmology, London

18: 625-672 (Nov.) 1934

Trachoma in the British Colonial Empire: Its Relation to Blindness; Existing Means of Relief: Means of Prophylaxis. A. F. MacCallan. —p. 625.
Adult Filaria (Wuchereria) Bancrofti in Anterior Chamber. R. E. Wright.—p. 646.
Catholysis as New Technic for Operative Closure of Holes in Retina and for Treatment of Its Detachment. A. Vogt.—p. 650.
Hinged Perforated Diaphragms for Trial Frame. P. J. Hay.—p. 652.

Clinical Science, London

1: 225-326 (Nov. 14) 1934

The Alleged Relation of Hyperfunction of the Posterior Lobe of the Hypophysis to Eclampsia and Nephropathy of Pregnancy. G. W. Theobald.—p. 225.
Relation of Hypercholesterinemia to Increased Tolerance for Thyroid Preparations in Nephrosis. R. S. Aitken.—p. 241.
*Effect of Diet of Pure Glucose on Fluid Balance of Body. F. B. Byrom.—p. 245.
*Influence of Diet on Sugar Tolerance of Healthy Men and Its Reference to Certain Extrinsic Factors. H. P. Himsworth.—p. 251.
Relationship Between Total Osmotic Pressures of Plasma and Edema Fluid in Man. E. J. Baldes and F. H. Smirk.—p. 265.
Nature of Myxedema. F. B. Byrom.—p. 273.
*Observations on Effect of Food, Gastric Distention, External Temperature and Repeated Exercise on Angina of Effort, with Note on Angina Sine Dolore. E. J. Wayne and A. Graybiel.—p. 287.
*Observations on Angina Pectoris and Intermittent Claudication in Anemia. G. W. Pickering and E. J. Wayne.—p. 305.

Effect of Diet of Dextrose on Fluid Balance of Body.—Byrom states that during the last two years a number of diabetic patients have been restricted, for therapeutic reasons, to a diet composed of pure dextrose dissolved in distilled water, for periods of from five to ten days. The daily intake of dextrose varied, in different cases, between 480 and 600 Gm., administered in equal doses every hour or every two hours throughout the twenty-four hours. Insulin was given simultaneously in sufficient quantity to prevent, in most cases, glycosuria or ketosis. The subjects were for the most part confined to bed and were allowed to drink extra distilled water at will. In some instances the patient was at first restricted to a fixed balanced diet, isocaloric with the dextrose diet, for a preliminary period of several days. This exclusively carbohydrate diet caused invariably an immediate loss of body weight amounting to several pounds. A sudden loss of weight of this degree, in the face of an adequate caloric intake of 2,400 calories daily, is likely to be due, substantially, not to destruction of body tissue but to loss of body fluid. It was found that this change was accompanied by a parallel loss of electrolytes (sodium and potassium) from the body in amounts which indicate that the loss of weight is due largely to depletion of the extracellular (water + sodium salts) and intracellular (water + potassium salts) compartments of the body fluid. The extracellular loss of fluid was caused by the sudden curtailment of the intake of sodium. Similarly the intracellular loss may be attributed primarily to potassium restriction. Destruction of protoplasm to yield protein may play a subsidiary part.

Influence of Diet on Sugar Tolerance.—Himsworth found that in normal human subjects the diminished dextrose tolerance and impaired sensitivity to insulin observed when the subject is taking a high fat diet do not depend on a change in the p_H of the blood to the acid side, and that the improved dextrose tolerance and increased sensitivity to insulin found in subjects receiving a high carbohydrate diet are unassociated with a change in the p_H of the blood to the alkaline side. The reaction of the blood was found to be the same on either diet. The production of a compensated alkalosis in a subject on a high fat diet resulted in no improvement either of the impaired sugar tolerance or diminished sensitivity to insulin. The presence of a compensated acidosis had no deleterious effect on the increased sugar tolerance and insulin sensitivity characteristic of the high carbohydrate regimen. In normal men the presence of a ketosis had no effect on either the dextrose tolerance or the sensitivity to insulin. The administration of raw liver to a subject balanced on a high fat diet produced no change in dextrose tolerance or insulin sensitivity. The daily oral ingestion of 25 Gm. of lecithin for a period of one week, to a subject standardized on a high fat diet, caused little or no change in the dextrose tolerance. Ten days after cessation of the lecithin administration a small delayed improvement in tolerance appeared to have occurred, although the subject continued to receive the same high fat diet.

Effect of Food, Gastric Distention, Temperature and Exercise on Angina of Effort.—Wayne and Graybiel observed the relationship of pain in cases of angina of effort to the taking of food, gastric distention, external temperature and repeated exercise. They found that an average reduction of 25 per cent in exercise tolerance occurred after a heavy meal in six cases of pure angina of effort. In the same six cases, exercise tolerance was unaffected by inflation of the stomach with air, even when sufficient air was introduced to give epigastric discomfort and to displace the heart. It is concluded that in angina of effort the reduction of exercise tolerance after food is due to the increased energy expenditure of the heart and not to gastric distention. In normal subjects, large amounts of air were introduced into and retained by the stomach. While the stomach was distending, slight changes in pulse and blood pressure occurred, but, when the stomach had adapted itself, no changes in the cardiovascular system could be detected, even though the heart was displaced mechanically. In a case of spontaneous angina in which both food and gastric inflation gave rise to attacks, it was considered likely that distention of the stomach may initiate reflexly an attack in this type of case. Variations in the external temperature did not affect exercise tolerance in six cases of angina of effort. Two types of angina of effort exist; in both, exercise tolerance is constant if sufficient rest is allowed between the end of one attack and the start of the next test. In one type, as this period of rest is reduced, exercise tolerance diminishes gradually; in the other there is a phase which may be as long as an hour, during which exercise tolerance is increased. Diminishing the rate of exercise had in two cases no effect and in four gave a moderate increase in the total amount of exercise performed. In a case in which the symptoms resembled those described under the term "angina sine dolore," investigation showed that the attacks were due to paroxysmal ventricular action brought on only by exercise.

Angina Pectoris and Intermittent Claudication in Anemia.—Pickering and Wayne point out that pains clinically indistinguishable from those of intermittent claudication and angina pectoris may occur in any type of severe anemia. Of twenty-five consecutive ambulatory cases of severe anemia, there was pain in the legs in seven and pain in the chest in eight, induced only by exercise and relieved by rest. After cure of the anemia, only one patient experienced pain in the legs and two pain in the chest. In nine grossly anemic patients, exercise of the limbs without circulatory arrest produced severe pain having the characteristics of intermittent claudication. After cure of the anemia, similar exercise produced slight or no pain. After a given amount of exercise, the flow of the blood through the active muscles is at least as great in the anemic as in the nonanemic state. The authors suggest that the stimulus which produces the pain of intermittent claudication is an accumulation in the tissue spaces of metabolites removed normally by oxidation. In six severely anemic patients, complaining of sternal pain or tightness on walking, the sensation was reproduced by exercise tests. In four patients the same exercises no longer produced pain or tightness when the blood contained more than 50 per cent of hemoglobin. In two patients the exercise tolerance increased with a rising hemoglobin content of the blood, but pain could still be induced when the blood was normal. The reaction of the rate of the heart and blood pressure to exercise is usually altered in anemia, and such alterations may contribute to the development of anginal pain. The essential factor in the production of anginal pain is a diminished oxygen supply to the working cardiac muscle. The authors' observations support the view that angina pectoris and

intermittent claudication are due to similar mechanisms operating in the cardiac and skeletal muscles. Reasons are given why some, but not all, anemic patients complain of angina or of intermittent claudication. No electrocardiographic changes characteristic of myocardial anoxemia were detected in anemic patients after exercise. In two cases the PR interval was abnormally long in the anemic state and was within normal limits after the anemia was cured.

East African Medical Journal, Nairobi

11: 241-272 (Nov.) 1934

Further Report on Bunyoni Leper Colony, Kigezi, for 1933-1934 with Statistics. L. Sharp.—p. 245.
Glaucoma. R. J. Harley-Mason.—p. 255.

Edinburgh Medical Journal

41: 653-728 (Dec.) 1934

Histologic Study of Normal Mamma in Relation to Tumor Growth: I. Early Development to Maturity. E. K. Dawson.—p. 653.
Fracture of the Femur: Statistical Analysis of Two Hundred and Eighty-Five Cases. L. B. Wevill and H. L. Wallace.—p. 683.

Glasgow Medical Journal

4: 185-224 (Nov.) 1934

Unrevealed Primary Carcinoma of Gallbladder: Report of Case with Unusual Metastases and Review of Literature. D. F. Cappell and G. R. Tudhope.—p. 185.
Diabetes Mellitus: Broader Basis of Interpretation. A. Glen.—p. 194.

Indian Medical Gazette, Calcutta

69: 601-660 (Nov.) 1934

Simple Method of Recovering Typical Cultures of Dermatophytes from Pleomorphic Growths. H. W. Acton and N. C. Dey.—p. 601.
Basal Metabolism of Indians in Health and Disease: Its Clinical Significance. J. P. Bose and U. N. De.—p. 604.
Further Observations on Treatment of Oriental Sore. J. D. Warma.—p. 616.
Clinical Observations on Six Hundred and Thirty-Six Cases of Cerebrospinal Fever Treated in the Campbell Hospital, Calcutta, from March 1933 to March 1934. N. C. Kapur, A. N. Sen and B. C. Chatterjee.—p. 621.
Ethidol in Treatment of Tuberculous Adenitis. H. T. Ince.—p. 625.
Treatment of Tuberculous Caries of the Spine. T. Seshachalam.—p. 626.
Carcinoma of Stomach. U. P. Basu.—p. 628.
*Molluscum Contagiosum: Preliminary Note on Treatment. L. M. Ghosh.—p. 630.

Molluscum Contagiosum.—Accepting the theory that molluscum is conveyed by a filter-passing virus and that the infection is a local one, the virus being confined to the molluscum nodules, Ghosh prepared a vaccine by emulsifying a nodule and killing the virus by formaldehyde. The result of the injection of this vaccine was encouraging, and the result has been uniformly successful in all the cases tried so far. About a fortnight is required for the complete cure, but improvement is noticed after ten days; i. e., after the third or fourth injection. The nodules first shrink, then dry up and drop off by themselves. No relapses have occurred as yet, although six months has elapsed with many cases. The author has not been able to determine whether an autogenous vaccine, prepared from the patient's own nodules, is more beneficial than a stock vaccine prepared from the nodules of other patients. In preparing the vaccine the skin is sterilized with a mixture of equal parts of ether and alcohol, and two or three nodules are cut off with sharp scissors. The nodules are collected in a small sterile test tube previously weighed in a fine balance. About 20 mg. of nodules is required. Freshly prepared sterile physiologic solution of sodium chloride is measured in a sterile test tube in the proportion of 1 cc. per milligram of nodule. The nodules are ground well with sterile pumice stone powder or fine sand in a sterile agate mortar until the emulsion is uniform and no tissue is felt or seen. The sodium chloride solution is added at intervals in small quantities. When the emulsion is completed the remainder of the solution is added. The emulsion is then filtered first through krysolgar and then through an L 3 Chamberland fine bacterial filter candle. The filtrate is incubated for twenty-four hours and tested for sterility. This forms the stock active emulsion. Of the stock active emulsion, 2 cc. is added to 8 cc. of formolized saline solution, again tested for its sterility, and the vaccine is ready for injection. Intradermal injection is given every third or fourth day, beginning with 0.1 or 0.2 cc. and increasing by 0.1 cc. or 0.2 cc. each time, according to the reaction.

Irish Journal of Medical Science, Dublin

No. **107:** 591-638 (Nov.) 1934

Anemia: Yesterday and Today. F. J. O'Donnell.—p. 591.
Acute Cholecystitis. S. Pringle.—p. 606.
*Brain Tumors in General Practice. A. A. McConnell.—p. 611.
Diagnosis of Abscess of the Brain. R. H. Micks.—p. 618.
*Simple Test in Tuberculosis of Kidney. J. McGrath.—p. 622.
Miners' Nystagmus F. O'Sullivan.—p. 629.

Brain Tumors in General Practice.—To determine what were the first signs that made the physician in charge suspect a tumor of the brain, McConnell has reviewed his case notes. The signs that in his cases have aroused the physician's suspicion of intracranial tumor have been headache of any type, especially in the morning; vomiting that did not materially interfere with appetite; epileptiform attacks, ranging from a transient "lapse" to full fledged convulsions; changes in mentality; retardation of growth; failure of vision; "queer feelings" in the limbs, and noises in the ear. Headache, vomiting and papilledema are the three cardinal manifestations of increased intracranial pressure. The patient can tell about the headache and vomiting, but he knows nothing of the choked disk, so that unless those symptoms suggest something to the physician the latter will not examine the optic disks, even if he is able to do so. It must be emphasized that it is papilledema, not failing vision, that is the classic sign of increased intracranial pressure; therefore papilledema must be looked for.

Test in Tuberculosis of Kidney.—McGrath outlines a test for the determination of the relative efficiency of each kidney. It consists of the gravimetric determination of the specific gravity of urine collected from each kidney through ureteral catheters. The test is especially helpful in cases of renal tuberculosis. The urine is centrifugated as soon as it is received. This throws down the formed elements that would cause errors in the determination of the specific gravity, and the sediment can be used to examine for pus and for tubercle bacilli. The supernatant urine is then pipetted into the specific gravity bottle. The bottle is stoppered, wiped and weighed. It is then emptied and is weighed again when filled with urine from the other side. It is lastly weighed full of distilled water. The difference in weight is due to the higher specific gravity of the urine. As large a bottle as possible is used, as liability to error is less.

Journal of Laryngology and Otology, London

49: 709-780 (Nov.) 1934

Operative Treatment of Facial Palsy, with Observations on Prepared Nerve Graft and on Facial Spasm. C. Ballance.—p. 709.
Malignant Disease of Larynx and Pharynx (Second Communication). A. Zuppinger and R. Stewart-Harrison.—p. 720.
Lipoma of Larynx: Intrinsic in Origin. H. S. Birkett.—p. 733.

49: 781-888 (Dec.) 1934

Clinical Observations on Chronic Deafness in Children. J. A. Keen.—p. 782.
Aspergillosis of the Nose and Maxillary Antrum. A. B. Kelly.—p. 821.

Lancet, London

2: 1207-1262 (Dec. 1) 1934

Landmark in Modern Neurology. W. Trotter.—p. 1207.
One Hundred Histamine Test Meals on Normal Students. F. P. Lee Lander and N. F. Maclagan.—p. 1210.
Surgical Anatomy of Anal Canal, with Especial Reference to Anorectal Fistulas. E. T. C. Milligan and C. N. Morgan.—p. 1213.
*Two Cases of Agranulocytic Angina: One Following Administration of Allonal. J. H. Fisher.—p. 1217.
Agranulocytic Angina: Case Treated with Pentnucleotide. E. J. Smith.—p. 1219.
The Origin of Cardiac Edema. M. O. Raven.—p. 1220.

Agranulocytic Angina.—Fisher presents two cases of typical agranulocytic angina that were admitted to the hospital as cases of diphtheria. The first patient was found to have a terminal pneumococcic septicemia. Agranulocytic angina developed in the other patient while in the hospital. Although suffering from diabetes, her condition was good and she was getting up each day. While there she had one tablet of allylisopropylbarbituric amidopyrine daily for seventeen days and 5 grains (0.3 Gm.) of soluble barbital for two days. Her

symptoms commenced on the seventeenth day, when she was transferred to another hospital. Apart from an occasional tablet of acetylsalicylic acid, she had taken no drugs prior to this. In the first case no drugs of any kind were being taken prior to the onset of symptoms. It therefore belongs to that category of cases in which no etiologic factor can be determined. The author was unable to obtain pentnucleotide in time for treatment, as both patients died fifteen and twenty-three hours, respectively, after admission. Both patients showed a complete absence of polymorphonuclear leukocytes and few myelocytes but numerous myeloblasts. The changes found were similar to those described by Fitz-Hugh and Krumbhaar, who put forward the hypothesis that the myeloid hyperplasia is due to a "primary maturation arrest" rather than to a "primary aplasia," and pointed out certain analogies to pernicious anemia. In hemorrhagic purpura the bone marrow may show either megakaryocytic hyperplasia or aplasia. Hubble suggests that there is one variety of agranulocytic angina and one variety of hemorrhagic purpura allied to aplastic anemia, for in all three the formation of blood cells is arrested at the reticuloendothelial stage by the absence of certain factors. The other varieties are comparable to megaloblastic anemia. In this last there is a circulating anemia in spite of proliferation of the megaloblast, hyperplasia of the megakaryocytes with a peripheral thrombocytopenia, and a myeloid hyperplasia with a peripheral agranulocytosis.

Medical Journal of Australia, Sydney

2: 597-628 (Nov. 10) 1934

*Laboratory and Epidemiologic Investigation of Outbreak of Weil's Disease in Northern Queensland. T. J. P. Cotter and W. C. Sawers.—p. 597.

Allergy in Theory and Practice. I. Maxwell.—p. 605.

Heat Cramps and Uremic Cramps, with Especial Reference to Their Treatment with Sodium Chloride. E. H. Derrick.—p. 612.

2: 629-664 (Nov. 17) 1934

Spinal Anesthesia. G. Brown.—p. 629.

Some Problems in Urology. J. Smith.—p. 634.

Further Observations on the Allantoic Membrane of the Embryo Chick and Its X-Ray Reactions. W. Moppett.—p. 640.

Weil's Disease in Northern Queensland.—Cotter and Sawers present the laboratory and epidemiologic observations of the Ingham epidemic of infectious jaundice. In discussing the problem of prevention they state that the combination in the Ingham district of moist conditions favorable to the existence of leptospirae, the presence of rats in great numbers and an industry that necessitates exposure of the workers raises a problem of great difficulty. The excess of water is intermittent and the nature and area of the country render drainage impracticable. In the Ingham area the rat may be of particular importance, as the flooding of the land is intermittent, and but for reinfection of the water the problem would not be so acute. The conditions in the cane areas are extremely favorable for rats, food and cover being plentiful. The destruction of rats is undoubtedly advisable; but an inspection of the country shows the magnitude and difficulty of the task. The persistence of leptospirae in the urine of human convalescents raises the question of the danger of human carriers, although there is little evidence that human carriers play an important part in the spread of the disease. In the Ingham outbreak there has been no evidence of spread by human carriers. General measures to prevent access of the organism to the mucous membrane of the mouth and to abraded skin are advisable; but the nature of the work of cutting cane and the climatic conditions render satisfactory application difficult. It is probable that persons recovered from the disease possess considerable immunity, and this naturally acquired active immunity may tend to decrease the incidence of the disease in the district. Artificial active immunization has been successfully attained in laboratory animals and with further investigation may prove a possible means of prevention in man.

Chinese Medical Journal, Peiping

48: 1017-1100 (Oct.) 1934

Medical Education and the Curriculum at the Peiping Union Medical College. F. R. Dieuaide.—p. 1017.

Study of Noma Complicating Kala-Azar in Children. P. L. Fan and Annie V. Scott.—p. 1046.

Monilia Vulvovaginitis. A. Wong and T. J. Kurotchkin.—p. 1058.

Blood Groups in Fukien Province. H. E. Campbell.—p. 1066.

Gynécologie et Obstétrique, Paris

30: 401-496 (Nov.) 1934

Kidney Diseases of Pregnancy of Hypertensive Character. J. Voron and H. Pigeaud.—p. 401.

External Hysterography. J. Leon and J. Diradourian.—p. 415.

*Hormone Therapy of Amenorrheas. R. Tschertok.—p. 423.

Blennorrhagia and Pregnancy. Astrinsky and Grinner.—p. 430.

Hormone Therapy of Amenorrheas.—Tschertok believes that many of the failures reported in treating amenorrhea by hormone preparations are due to insufficient analysis of the individual character of the amenorrhea. He divides amenorrheas into five groups and discusses the possibilities of hormone treatment for each. In the first group amenorrhea results from changes of the uterine mucosa, the ovaries remaining normal. Here there are no indications for hormone therapy. In the second group amenorrhea results from insufficient ovarian function with normal function of the anterior lobe of the hypophysis. Here hormone therapy must consist in the introduction of the missing ovarian factors. Estrogenic substance is to be recommended; the author obtains good results by the use of the urine of pregnant women in the last months. In the third group amenorrhea results from insufficient functioning of the anterior lobe of the hypophysis. Here alternating injections of anterior pituitary-like principle and estrogenic substance are recommended. The fourth group, which results from an excessive functioning of the follicular apparatus, is wholly unaffected by hormone therapy. In the fifth and final group, amenorrhea is the result of general causes. If hormone therapy is employed, it should be combined with other measures aimed at improving the general condition. Thus, he believes, hormone therapy requires patience and months of observation after each case has been carefully studied and classified, the proper therapy instituted and the dose individualized.

Presse Médicale, Paris

42: 1877-1892 (Nov. 21) 1934

Diseases of Sedentary Life. M. Labbé.—p. 1877.

*Leaving Uterus After Bilateral Salpingo-Ovarectomy. H. Costantini.—p. 1878.

Leaving the Uterus After Salpingectomy.—Costantini deplores the systematic removal of the uterus when it is merely necessary to remove diseased adnexa. He questions the rationale of performing a subtotal hysterectomy because it is easy and leaving the cervix in place when it is that portion of the uterus which is most dangerous. He believes, however, that leaving the uterus in the presence of bilateral salpingitis possesses the following advantages: 1. The pelvic equilibrium is preserved. 2. The menstrual periods reappear in from 30 to 40 per cent. 3. Auto or thoracoplastic ovarian graft becomes possible and raises the percentage of menstrual period restorations to perhaps 70. 4. The functional disorders of the surgical menopause are less frequent and less serious than those following hysterectomy.

42: 1997-2012 (Dec. 12) 1934

*New Anti-Infectious Therapy: Carbon Intravenously. A. Touraine and B. Menetrel.—p. 1997.

Treatment of Toxicomanias by Emulsion of Vegetable Lipids. R. Dupouy and M. Delaville.—p. 1998.

Treatment of Infections with Intravenous Injections of Carbon.—Touraine and Menetrel, after using animal carbon with some success, tried the vegetable carbon, which is not a wood extract. This has a good absorbing power and possesses an electric charge in gamma rays which may be photographed. This carbon, calcinated at a high temperature in contact with metallic vapors, was carefully neutralized, ground, pulverized and suspended in a 2 per cent solution of sodium chloride. The action was compared with that of animal carbon on the rabbit and then on man. The activated carbon seems to be better tolerated than the animal carbon. The anti-infectious action was tested in the rabbit without definite results. Some rabbits infected with cultures of staphylococci were more resistant after having received injections of carbon, but definite cures were obtained in only four of twenty cases. In some cases of human suppurative conditions, the results of carbon injections were more favorable. The injections are not painful and produce no early or late inflammatory reactions. The authors believe that the method of treatment is promising.

Prensa Médica Argentina, Buenos Aires

21: 2149-2196 (Nov. 14) 1934

*Liver Function in Pulmonary Tuberculosis. A. A. Raimondi and W. d'Amato.—p. 2149.
Pulmonary Murmur in Echinococcosis of Lung. J. J. Beretervide.—p. 2156.
Typhoparatyphoid Agglutination After Oral Immunization. R. F. Vaccarezza, L. M. Martinez Dalke and A. J. Vaccarezza.—p. 2160.
Endoscopy in Diagnosis of Esophagotracheobronchial Diseases. J. Mingo.—p. 2165.
Glioma of Retina: Case. B. Just.—p. 2180.

Liver Function in Pulmonary Tuberculosis.—Raimondi and d'Amato state that hepatic insufficiency is commonly observed in patients having pulmonary tuberculosis. They observed the liver function, especially the chologenic function, in twenty-two patients: four had tuberculosis in evolution, thirteen active tuberculosis and five arrested tuberculosis. The four patients of the first group had clinical and functional symptoms of liver insufficiency and slight allergy; a cutireaction of one plus in one patient, of two plus in two and of one plus-D in one. In three patients of this group, the hepatic function was diminished. Seven patients of the second group had functional and clinical symptoms of liver insufficiency, diminished hepatic function and allergy resembling that in patients having tuberculosis in evolution; that is, a cutireaction of one plus in two patients, two plus in two and one plus-D in three. The remaining six patients in this group did not show symptoms of liver insufficiency. Nevertheless the liver function was partially diminished and they had a better condition of allergy than did those of the subgroup of the same group; that is, a cutireaction of one plus in two and of two plus in four patients. The hepatic function of the patients having arrested tuberculosis was better than that in the patients of the previously mentioned groups and the allergy was more intense; that is, a cutireaction of three plus in all patients of the group. Generally speaking, there is a parallelism between the activity of the tuberculous lesion and the involvement of the liver function, which may serve as a prognostic datum. The study of the biligenic function is important in relation to the nutrition of tuberculous patients, since bile favors digestion, and above all the absorption of fats, owing to its zymogenic action on digestive ferments and stimulating action on the secretion of pancreatic juice. Bile also has a stimulating action on the motor functions of the duodenum and rectum, the movements of intestinal villi, the circulation of chyle and intestinal evacuation.

Revista Argentina de Cardiologia, Buenos Aires

1: 267-336 (Sept.-Oct.) 1934

*Peripheral Sign of Aortic Diseases. L. Gonzales Sabathie.—p. 267.
*Diagnostic Sign of Total Auriculoventricular Block. P. Cossio and L. Lascalea.—p. 276.
Mean Intraventricular Pressure During Ejection Phase. J. Duomarco.—p. 281.
Mean Arterial and Mean Intraventricular Pressure. J. Duomarco and R. Piaggio Blanco.—p. 287.

A Sign of Aortic Disease.—Gonzales Sabathie says that the verification of blood stasis of the left external jugular vein (either predominant, if bilateral, or exclusive, if unilateral) is in most cases a sign of aortic disease. He found the sign in patients suffering from any of the following aortic diseases: (1) arterial hypertension associated with aortic alterations, (2) aortitis, (3) aortic sclerosis and (4) aortic aneurysm. The sign is so noticeable in some cases that it may be observed with the patient dressed and in the standing position. When it cannot be seen in these conditions in patients suspected of being sufferers of aortic disease, it may be clearly noticed during deep expiration when the patient is placed in the dorsal decubitus with uncovered neck and the head turned to the right. Because of the intimate anatomic relations between the left innominate vein and the higher point of the aortic arch, the blood stasis of the external jugular vein may be interpreted as caused by a compression of the former by the latter due to a pathologic lengthening of the aorta. The fact that the presence of the sign coexists, in most cases, with an increased venous pressure and a decreased velocity of the circulation in the left side seems to make the pathogenic interpretation of the sign more plausible.

Diagnostic Sign of Complete Auriculoventricular Block.—Cossio and Lascalea describe a sign of diagnostic value in complete auriculoventricular block. It is an occasional third heart sound occurring early in diastole, immediately after the second sound in such a manner that it may be interpreted as a reduplication of the latter. It is heard by auscultation of the heart region from the left third costal cartilage to the apex. The phonocardiographic and electrocardiographic records, taken simultaneously, show that the third heart sound appears whenever the P wave falls immediately after the T wave of the previous ventricular beat; that is, at the exact moment in which the ventricular rapid inflow phase takes place. The casual summation of the auricular systole and the ventricular inflow is the determining cause of the third heart sound.

Jahrbuch für Kinderheilkunde, Berlin

143: 321-380 (Dec.) 1934. Partial Index

*Prodromal Stage of Poliomyelitis and Its Significance for Early Diagnosis and Therapy. E. Wieland.—p. 321.
*Poliomyelitis. J. A. Toomey.—p. 353.
Histologic Aspects of Vasomotor Centers in Death from Diphtheria. P. von Kiss and B. Horányi-Hechst.—p. 363.

Prodromal Stage of Poliomyelitis.—Wieland asserts that since 1910 poliomyelitis has become more severe. Whereas before that time it attacked almost exclusively small children without prodromal signs and hardly ever was fatal, it is now observed also in older children and in adults; its lethality has increased, and meningitic, neuritic and abortive types are more frequent. However, together with the polymorphic symptomatology there appears also a formerly unknown preparalytic stage, the prodromes of poliomyelitis, which are of two types. The indefinite ones are general or localized conditions of weakness of the musculature. Walking may become faltering, jerking may appear in the arms and legs, indefinite rheumatoid pains may become manifest or the patient may suddenly collapse (like a "pocket knife") but then regain the use of his extremities. The second type of prodromal signs are definite and localized signs of neurogenic irritation and they are generally three in number: Lasègue's sign, the spine sign and rigidity of the neck. Lasègue's sign consists of a painful pressure point at the site where the sciatic nerves emerge from the pelvis, at the ischiadic foramen. The spine sign is a peculiar pain in the back and along the entire spinal cord. The third sign, the rigidity of the neck (meningism), is more noticeable than the others and consequently better known. The author emphasizes that on the early recognition and the correct estimation of the prodromal symptoms depends the early diagnosis and with this the possibility of a specific serotherapy of poliomyelitis. If the three characteristic prodromal signs are absent, which is the case in all abortive or in certain masked cases of poliomyelitis, the suspicion of poliomyelitis may be corroborated by the characteristic aspects of the cerebrospinal fluid. The author thinks that the symptomatic treatment is not made superfluous by modern serotherapy. The fact that fifteen of twenty-one patients with new poliomyelitis showed an intense reddishness of the pharynx and sensitive submaxillary glands, and that only five had a temporary intestinal catarrh, he considers an indication that the pharyngeal organs are the most frequent port of entry for the virus of poliomyelitis.

Poliomyelitis.—Toomey agrees with some others on the point that the gastro-intestinal tract is the primary port of entry for the disease. The development of poliomyelitis may be explained, he says, by considering the virus of the disease a facultative toxin for the gray fibers. He made studies on the feces and the serum of patients with poliomyelitis. He discovered a toxic substance in the stool and the urine of patients with poliomyelitis. The spinal cord of animals that had been given injections of emulsions from the excreta of patients with poliomyelitis presented a pathologic picture similar to that in poliomyelitis. That these reactions were specific was proved by the effects of the injection of serum from patients in the acute stage and by serum from convalescents. In further experiments the author aimed at determining whether organisms of the colon or the paratyphoid groups, found in the stools of patients with poliomyelitis, have a toxic effect. He cites other factors that indicate a gastro-intestinal nature for poliomyelitis and further discusses the involvement of the sympathetic nervous system. After reviewing experiments with virus injections and attempts to produce the disease from the gastro-intestinal tract,

he describes a technic which he found effective in the experimental production of poliomyelitis by way of the gastro-intestinal tract. He points out that the anatomic conditions make it appear possible that the spread of the virus takes place along the postganglionic, sympathetic fibers that have no medulla and toward the two unprotected sites in the medulla, which have no myelinated connective fibers with the sympathetic system; that is, the cervical and lumbar regions. This would explain why the terminal effects of the disease become manifest in the extremities. The author is of the opinion that the poliomyelitis virus as such is rather harmless and is not the only cause of the disease. He believes that the intestinal organisms likewise play a part in the pathogenesis of poliomyelitis.

Klinische Wochenschrift, Berlin

13: 1737-1776 (Dec. 8) 1934. Partial Index

*Inhibition of Thyroid Activity by Animal Blood. H. Eitel and A. Loeser.—p. 1742.
Vitamin C Content of Brain and of Cerebrospinal Fluid in Its Dependence on Age. F. Plaut and M. Bülow.—p. 1744.
Influence of Short Waves on Bacteria. H. Lippelt and C. Heller.—p. 1745.
Influence of Circulatory Hormone on Resorption of Intracutaneous Sodium Chloride Wheal. H. Frenkel.—p. 1749.
*Allergy and Eclampsia. R. Knepper.—p. 1751.
Serologic Diagnosis of Cancer, with Especial Consideration of Lehmann-Facius Cancer Reaction. S. Nakagawa, T. Takasugi, S. Ogawa and J. Yoshida.—p. 1755.

Inhibition of Thyroid Activity by Animal Blood.—Eitel and Loeser show that animal blood is capable of reducing the action of the thyroid secretion. If guinea-pigs are fed with thyroid and at the same time are given normal blood or serum, the typical decrease in weight does not become evident. Admixture of blood likewise prevents the over hasty development of tadpoles, which is ordinarily induced by the thyroid hormone. Thus it appears justified to resort to blood therapy in the treatment of disorders of the thyroid, which Bier did with success as early as 1901. Blum was able to prove that this action of the blood is not due to the protein bodies but rather to a substance that he designates as thyroid "catechin." The observation that the administration of blood reduces the general symptoms (loss of weight, increased metabolic rate, tachycardia, sweating, diarrhea, exophthalmos and so on), which result from an alteration in the thyroid activity, induced the author to investigate whether it influences also the site of production of the hormone, the thyroid. His assumption that this is the case was corroborated by the abolishment of the thyroid stimulating action of the thyrotropic hormone of the anterior lobe of the hypophysis following the injection of animal serum as well as following the oral administration of animal serum. The abolishment of the thyroid activating capacity of the thyrotropic hormone permits an estimation of the antithyroidal action of the market preparations that have been obtained by extraction from the blood.

Allergy and Eclampsia.—Knepper was able to demonstrate in animal experiments that the combination of the serum-hyperergy experiment with injections of the hormone of the posterior lobe of the hypophysis produces changes in the organs that are typical for eclampsia. He thinks that these experiments indicate that eclampsia is a combination of the increased production of the hormone of the posterior lobe of the hypophysis with an allergic (hyperergic) reaction of the tissues.

13: 1777-1808 (Dec. 15) 1934. Partial Index

*Ratio of Rest Nitrogen in Blood and in Cerebrospinal Fluid in Healthy Persons and in Patients with Renal Disease. G. Straube and E. Leitritz.—p. 1779.
Neurologic Disturbances in Thrombo-Angiitis Obliterans (Buerger). K. H. Stauder.—p. 1784.
Influence of Melanophore Hormone on Dark Adaptation of Human Eye. W. Buschke.—p. 1785.
*Procaine Hydrochloride in Treatment of Adiposis Dolorosa (Dercum's Disease). R. Boller.—p. 1786.
Alcoholemia Following Intravenous Injection of Alcohol. G. Dell'Acqua.—p. 1789.

Rest Nitrogen in Blood and in Cerebrospinal Fluid.—Straube and Leitritz found that the rest nitrogen in the cerebrospinal fluid reaches nearly the height of the rest nitrogen in the blood serum. The rest nitrogen quotient "serum: cerebrospinal fluid" lies between 0.92 and 1.35, the mean being 1.095. This quotient increases in cases of slight increase in the rest nitrogen of the serum if the pressure of the cerebrospinal fluid is normal, and it decreases if the lumbar pressure is increased. In nephropathies with insufficiency, the ratio between the rest nitrogen in the serum and that in the cerebrospinal fluid is the same, and it may be concluded that the same regularities exist as in other cases.

Procaine Hydrochloride in Treatment of Adiposis Dolorosa.—Boller states that he first employed a procaine hydrochloride solution for the treatment of adiposis dolorosa (Dercum's disease) in 1930 and that the result was favorable. He uses a sterile 0.2 or 0.4 per cent solution of procaine hydrochloride to which a 0.4 per cent solution of sodium chloride is added. The solution should always be freshly prepared, for after several weeks it becomes yellowish and loses its efficacy. At the first injection the author administers from 10 to 20 cc., and later he gradually increases the amount to 40 or 60 cc. The injections are given daily or at intervals of several days. The author considers it advisable to make several successive injections into one part of the body and later into other parts. As a rule, after one or two injections the pains subside in the part into which the injections have been made, but they completely disappear only after several portions of the body have been treated. The author recommends the use of a needle from 10 to 12 cm. in length. The injections should be made in such a manner that hardened portions in the subcutaneous fat tissues may be reached and infiltrated. Intracutaneous injections are inadvisable. The injections are rather painful, but, since improvement is generally noticeable after two or three injections, the patients usually do not object to further injections. The author reports the histories of several cases and then reviews theories on the pathogenesis of adiposis dolorosa. He thinks that the efficacy of the procaine hydrochloride injections indicates that Dercum's disease is an obesity that is complicated by polyneuritis. The procaine probably counteracts the inflammation of the nerves in the fat tissues, so that the spontaneous as well as the pressure pains disappear.

Medizinische Klinik, Berlin

30: 1617-1648 (Dec. 7) 1934. Partial Index

New Problems of Diabetes Mellitus in Their Connection with Pathogenesis of Diabetic Symptoms. H. Schur.—p. 1617.
Indications for Surgical and Orthopedic Treatment During Childhood. C. Springer.—p. 1622.
Is Especial Medical Attention Required During Period of Breaking Through of Teeth? Schoedel.—p. 1625.
*Secondary Effects of Amidopyrine. H. Lotze.—p. 1628.
*When Is Roentgenoscopy Necessary in Obstetrics? K. Heyrowsky.—p. 1630.
Tremors of Eyes in Miners. M. Bartels.—p. 1632.

Secondary Effects of Amidopyrine.—Lotze studied cases of acute and chronic polyarthritis, which had been treated with amidopyrine, for the appearance of undesirable secondary manifestations. He observed five cases in which amidopyrine caused inhibition of diuresis and impairment of the excreting renal tissues. These changes proved reversible. He observed one patient, in whom a lethal amidopyrine intoxication developed with signs of general intoxication and of impairment of the central nervous system. He thinks that in this case especially predisposing factors were responsible for the unfavorable action of amidopyrine. He believes that the occasional appearance of more or less severe intoxications in the course of prolonged treatment with comparatively large doses is no reason to dispense with the use of a medicament as effective as amidopyrine in the treatment of polyarthritis.

When Is Roentgenoscopy Necessary in Obstetrics?—Heyrowsky says that roentgenoscopy should be resorted to only in those pregnant or parturient women in whom an obstetric complication is to be feared or has already developed, and in whom clinical examination does not entirely clarify the condition. He thinks that anomalies of the pelvis represent the largest number of cases in which roentgenoscopy is necessary. He admits that anomalies of the pelvis may be detected by vaginal examination, but he thinks that it is not advisable so far as the estimation of the measurements of the pelvis is to decide whether spontaneous delivery is possible or a cesarean section is necessary, and, if the latter is the case, a vaginal examination is undesirable, even if it is done under aseptic conditions. This point of view must be taken not only at the onset of the delivery but also during the last few weeks of pregnancy, for an investigation of the statistics on the mortality and the

morbidity of the cesarean operations in cases with and without vaginal examinations bears this out. Thus it is the safety of the mother that makes roentgenologic examination of the pelvis preferable to vaginal examination. The author points out that in positional anomalies of the fetal head a general surveying roentgenoscopy should be made as well as a lateral exposure. The general roentgenoscopy alone is sufficient for the determination of the position of the fetus and for the diagnosis of plural fetuses, of a monster or of the death of the fetus. The presence of several fetuses can usually be determined by palpation, but, if this is impossible, roentgenoscopy should be done. Pelvic presentation can always be detected by clinical examination, and it is unnecessary to incur the expense of a roentgenoscopy. The author rejects roentgenoscopy for the purpose of measuring the fetal head. He emphasizes that roentgenoscopy should be the last resort in obstetric diagnosis and says that it is possible to make two obstetric roentgenograms without having to fear the least damage to the fetus.

30: 1649-1680 (Dec. 14) 1934. Partial Index

Causes of Elicitation of Delivery. H. Knaus.—p. 1649.
Roentgenologic Serial Examinations on Influence of Various Antacids. A. Beutel and P. Mahler.—p. 1656.
*Syphilis and Tuberculosis: Clinical Experiences in Sixty-Six Cases. F. Ernst.—p. 1657.
Hemitetany in Uremia. A. Landsiedl.—p. 1659.
*New Method of Short Wave Therapy. J. Kowarschik.—p. 1661.
*Weltmann's Coagulation Band in Syphilis. Grete Sicher and A. Wiedmann.—p. 1664.

Syphilis and Tuberculosis.—Ernst made his observations on sixty-six patients who had syphilis and tuberculosis. They were detected among 6,000 patients with pulmonary tuberculosis. This number includes only those who had a positive syphilis reaction and not those who stated that they had a former syphilitic infection but now gave negative reactions. The infection with syphilis antedated the manifestation of tuberculosis in most cases by several years, the opposite occurring in only four cases. A direct unfavorable influence on the tuberculous or the syphilitic process was observed in none of the cases. The author emphasizes that the serologic examination for the presence of syphilis cannot be dispensed with in institutes for tuberculous patients, for about half of the patients state at first that they do not have the syphilitic infection. However, he thinks that the Wassermann test may be omitted and that it is sufficient to use one of the flocculation tests. The course of syphilis is usually mild in tuberculous patients. Pulmonary tuberculosis appears almost exclusively in the form of tertiary phthisis that progresses in the apicocaudal direction. As regards the life expectancy of the patients with open tuberculosis, there is no noticeable difference in patients with or without syphilis. The healing tendency is considerably less in patients with syphilis than in those without (6.6 per cent compared to 30 per cent). Antisyphilitic treatment often improves the therapeutic results.

Method of Short Wave Therapy.—Kowarschik points out that the short waves are used almost exclusively in the condenser or the electrical field, in which case the electrodes are separated either by an air distance or by a solid isolator such as rubber. It is suggested that the magnetic or, expressed more specifically, the electromagnetic field, be employed. The treatment in the electromagnetic field is not new, as d'Arsonval introduced it under the term of autoconduction four decades ago. He suggested that the entire body, or portions of it, should be brought into wire spools (the so-called solenoids) through which high frequency currents pass. Inside of such spools there exists a magnetic field, the field lines of which run approximately parallel to the axis of the spool. This field produces induction currents in conductors placed in the spool. The author decided to take up once more the idea of d'Arsonval and to try to employ the short wave therapy in the electromagnetic field. He hoped that with a frequency 100 times as great as that which was used by d'Arsonval it would be possible to produce more convincing biologic and therapeutic actions. He describes experiments conducted in trying to devise a satisfactory instrumentarium, reports tests on the heating of stratified material, plants and animals, and finally describes the therapeutic application. The treatment in the spool field is not meant to be an improvement of the condenser method and does not detract from this method. Such disorders as furuncles of the face or lips, disturbances of the sinuses, abscesses of the sweat glands of the axilla and mastitis will still be treated in the condenser field. However, disorders like osteomyelitis, which involve parts of the extremities, or disorders of the different joints of the extremities, can be treated more effectively with the solenoid.

Weltmann's Coagulation Band in Syphilis.—Sicher and Wiedmann demonstrate that syphilis is one of those disorders which cause the coagulation band to deviate to the right. To explain this manifestation, they call attention to the productive character of the syphilitic process and compare it with tuberculosis. The deviation of the coagulation band to the right is entirely independent of the Wassermann reaction, but it is observed more frequently in cases in which the Wassermann reaction is positive. A widening of the coagulation band (deviation to the right) is not a regular occurrence in patients with new infections, but in patients in whom the process is in the true primary stage a deviation to the right is observable. The authors emphasize that they do not wish to detract from the value of the lipoid reactions or to replace them. They believe, however, that by further systematic observations on the coagulation capacity of the serum they might be able to learn something new about the nature of the syphilitic process and eventually supplement the results of the lipoid reactions.

30: 1681-1716 (Dec. 21) 1934. Partial Index

Bacillemia in Eye Diseases. E. von Hippel.—p. 1681.
Clinical Aspects and Therapy of Allergic Diseases of Gastro-Intestinal Tract and of Biliary Passages, E. Urbach.—p. 1683.
*Prognosis and Treatment of Secondary Amenorrhea. E. W. Winter.—p. 1694.
New Method of Short Wave Treatment. J. Kowarschik.—p. 1698.

Prognosis and Treatment of Secondary Amenorrhea.—Winter mentions that secondary amenorrhea is that type in which up to a certain time the menstruation has been normal. He stresses the importance of a thorough general examination and discusses two cases that were treated for about two months. The result of hormone treatment was not encouraging in these cases. In the first woman the administration of more than 80,000 mouse units of estrus-inducing hormone produced a menstruation of two days' duration, but the systematic administration of estrus-inducing and corpus luteum hormone did not result in menstruation. In the second patient more than 100,000 mouse units of estrus-inducing hormone effected no menstrual bleeding, but the combination of hormones induced two regular menstruations. He thinks that in mild cases without atrophy of the uterus in which the amenorrhea has not existed a year, Kaufmann's systematic treatment with estrus-inducing and corpus luteum hormones may be tried. In the more advanced cases, he advises beginning with the hormone of the anterior hypophysis and continuing with estrogenic preparations, giving daily from 300 to 400 units, partly by injection and partly by mouth. He thinks that in these cases a trial might be made with serum from pregnant women, and if, under the influence of this treatment, the function of the genitalia seems to improve (greater turgescence of uterus and vagina), the estrogenic preparations may be followed by the administration of corpus luteum. After menstruation has set in, the hormone therapy should be continued with small or medium-sized doses. The hormone treatment should be supported by general measures, by diathermy, by balneologic treatment and by providing sufficient amounts of vitamins, particularly vitamin E.

Münchener medizinische Wochenschrift, Munich

81: 1917-1958 (Dec. 13) 1934. Partial Index

*Surgical Prognosis in Obese and in Lean Patients. E. Seifert.—p. 1917.
Operations on Brain and General Surgery with Consideration of Anatomy and Physiology of Cerebrospinal Fluid System. F. Schörcher.—p. 1924.
Diagnosis of Tumors of Retroperitoneal Space. H. Durst.—p. 1930.
Thoughts of Practitioner on Pathogenesis of Rheumatic Disease. F. Worthmann.—p. 1932.
Unsuccessful Vaccination with Carcinoma Cell Juice. G. Blunck.—p. 1933.
Anesthesia in Orthopedic Interventions on Children. H. Mündtrath.—p. 1934.
*Endocrine System in Its Relation to Chronic Rheumatism and Chronic Articular Disorders with Consideration of Therapy. H. Sauerwald.—p. 1935.

Surgical Prognosis in Obese and Lean Patients.—Seifert investigated the histories of patients undergoing abdominal operations. In diagrams he shows that the surgical mortality of the obese persons exceeds that of lean persons

in operations for appendicitis, cholecystitis, ventricular ulcer and ventricular carcinoma. He analyzes the causes that lead to the fatal outcome. These diagrams show that the lean person who dies following an operation on account of an abdominal disorder generally succumbs to the disease as such or to a complication arising from the intervention (peritonitis). The death of the obese person, however, results primarily from factors determined by his obesity, the failure of the circulatory apparatus playing the most important part. The author shows further that the obese person is at a disadvantage if he survives the operation, for disturbances in the postoperative course are more frequent in obese than in lean patients. The following postoperative complications are more frequent in obese patients: suppuration of the surgical wound, bronchitis, thrombosis and infarct, pneumonia and collapse.

Relations of Endocrine System to Articular Disorders.—Sauerwald points out that a connection between the endocrine system and rheumatic and articular disorders was demonstrated by Unger more than two decades ago but that the complicated interrelations did not become sufficiently clear until Abderhalden introduced interferometry into the diagnosis of chronic articular disorders. He shows a normal curve obtained by interferometric tests on the endocrine functions, and also curves obtained on women with endocrine and articular disturbances. The latter curves indicate various endocrine disorders, but there seems to be always a predominance of the ovarian disturbance. He treated cases of rheumatic and articular diseases in women with endocrine, particularly ovarian, disturbances, successfully by administration of estrus-inducing hormone. During the first eight or ten days, the patients are given daily 100 mouse units and after that every second day the same quantity. The hormone is given in the morning, on the fasting stomach. The symptoms usually become exacerbated during the first eight or ten days, but, if after that the dosage is reduced, they disappear rapidly. The short period of irritation indicates that the hormone preparation is effective. Frequently the administration of the estrus-inducing hormone improves not only the articular disturbances but also the general condition. The author considers it advisable to continue the administration of the hormone after clinical cure and to repeat it for several weeks about twice a year.

Vestnik Khirurgii, Leningrad

34: 1-386 (No. 100) 1934. Partial Index

Observations on Operative Treatment of Perforated Gastric Ulcers. N. N. Malinovskiy.—p. 48.
Intestinal Spasm as Causative Factor of Chronic Vicious Circle. A. A. Segal.—p. 56.
Removal of the Appendix Without Burying of the Stump. M. G. Kamenchik.—p. 66.
Appendectomy Without Peritonization of Stump. A. A. Nemilov and N. I. Filimonov.—p. 73.
*Myxoglobulosis Appendicis. G. G. Karavanov.—p. 78.
*Immediate and Late Results of Lumbar Sympathectomy in Treatment of Spontaneous Gangrene. A. N. Filatov.—p. 130.

Myxoglobulosis of Appendix.—According to Karavanov, the condition is characterized by distention of the lumen of the appendix by a mass consisting of granules and having the appearance of boiled sago. The pathologic picture of this condition, also known as pseudomyxoma of the appendix, is characterized by obliteration of the proximal portion of the appendix, cystlike enlargement, and a mucous colloidal content. This content is usually sterile and its chemical character is that of a pseudomucin. He reports a case and reviews forty-two cases collected from the literature. The globules found in the colloid consist of albuminous substances and of pseudomucin. Histologic studies point to a chronic inflammatory process with atrophy of the glands of the mucosa in the distal portion. The etiology of the sago-like bodies is one of retention of secreted mucus in the excretory ducts of the glands of the mucosa. The occluded ducts cause the accumulation of the mucus. Eventually the occluded duct ruptures and the rounded mass of mucus is extruded into the lumen of the appendix. The course of the disease is that of a chronic appendicitis. It has been discovered accidentally in the course of operations for some other condition than appendicitis, and at necropsies. Myxoglobulosis of the appendix is a rare form of pseudomyxoma of the appendix. The rupture of such a cystic dilatation may lead to formation of pseudomyxoma of the peritoneum.

Lumbar Sympathectomy in Treatment of Spontaneous Gangrene.—Filatov reports the results of lumbar sympathectomy in thirty-four cases of spontaneous gangrene of the lower extremities. An excellent immediate result was obtained in seventeen, a satisfactory result in eleven and no result in five; there was one death due to the infection of the operative wound and general sepsis. Of fourteen cases followed for not less than one year and as long as six years, an excellent result was obtained in nine and a satisfactory result in two. In the remaining three cases there was a return of morbid manifestations after six months, two years and three years, respectively. The author had collected 294 reported cases up to 1929 which, with his own and those of his chief, make up a total of 379 cases. A satisfactory immediate result was obtained in 80 per cent of this total. In a large proportion of the cases the result was permanent. The author considers lumbar sympathectomy a well founded procedure in cases of spontaneous gangrene of the lower extremities. Its effect is to remove the vasomotor disturbances and to improve the collateral circulation. The author stresses the importance of a faultless technic. To secure success, complete sectioning of all sympathetic fibers is necessary. The success of the procedure depends on careful selection of cases. Sympathectomy is a rational procedure in the presence of vasomotor disturbances and in the absence of diffuse thrombosis. The effect of injection of a nonspecific protein serves as a most accurate indication. The author prefers typhoid vaccine. The effects to be observed after the injection of the nonspecific protein are (1) the vasomotor index, (2) the return of pulsation or improvement in pulsation and (3) the improvement in the subjective symptoms. The vasomotor index is arrived at by comparing the rise in the local skin temperature of the involved extremity and the rise in the general body temperature. If it is more than 2 degrees, a good result may be expected.

Ugeskrift for Læger, Copenhagen

98: 1365-1394 (Dec. 13) 1934

Simple Bed Apparatus for Exercises in Movement (Active and Passive). H. Wulff.—p. 1365.
*Iron Therapy in Pernicious Anemia. E. Mogensen.—p. 1368.
*Intermittent Myeloblastosis. A. Nyfeldt.—p. 1372.
*Aleukemic Lymphatic Leukosis. O. Knudsen.—p. 1374.

Use of Iron in Treatment of Pernicious Anemia.—Four cases of pernicious anemia are reported in which remission after liver or stomach treatment ceased at a certain early stage and continued only after the institution of treatment with iron. Iron therapy produced a rise in both the erythrocyte count and the hemoglobin percentage. Mogensen says that this combined deficiency disease, pernicious anemia with iron deficit, is certainly more common than is usually supposed. There were no complications as a possible cause of the iron deficiency; it may be due to the demand on the iron reserves of the organism during the forced blood platelet production in the introductory remission. The possibility of a combination of pernicious anemia with simple achylic anemia is discussed.

Intermittent Myeloblastosis.—In Nyfeldt's patient, a girl aged 16, suffering from anemia, examination of the blood gave a subnormal leukocyte count with otherwise all signs of pronounced irritation of the bone marrow, and marked anemia. Treatment with liver and iron resulted in complete return to a normal blood picture, except for a slight oligochromemia. After some months, symptoms of anemia again developed and on readmission the diagnosis of myeloblastic leukosis was certain; death followed in two weeks. The author finds no analogous cases in the literature but describes a similar instance seen in experimentation with chicken myeloblastosis.

Aleukemic Lymphatic Leukosis.—Knudsen says that this case, in a girl aged 3, was interpreted as hemorrhagic aleukia (Frank) with apparent recovery (*Ugesk. f. Læger* **96**:164 [Feb. 8] 1934). Four months after discharge, the patient was readmitted. The picture gradually became more like a lymphatic leukosis and was fatal after five weeks. Necropsy confirmed the clinical diagnosis of lymphatic leukemia. Attention is called to the complete restitution between the two attacks, to the exceedingly low number of white blood corpuscles on the first admission, and to the almost complete absence of enlargement of lymph glands and spleen.